

## Research Article

# Continuing Medical Education for Primary Care Physicians in Israel: A Cross-Sectional Study

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Acquiring a medical degree is only the beginning of a prolonged learning process. At some point, formal studies end, and continuing medical education (CME) may be left to personal initiative. To assess lifetime learning (LL) and CME among primary care physicians in Israel, a self-administered questionnaire, based on the Jefferson Scale of Physician Lifelong Learning (JSPLL), was mailed to 4,104 primary care physicians. A total of 979 completed the study, 53.4% males with a mean age of  $51.8 \pm 8.3$  (range 31–79). A logistic regression model showed that male gender ( $OR = 1.5, P < 0.05$ ), teaching ( $OR = 4.5, P < 0.0001$ ), and not working in a rural clinic ( $OR = 0.6, P < 0.01$ ), increased the LL score. The results of the study demonstrate a need to address special subgroups that have a lower tendency to engage in LL activities. Policymakers should develop strategies to increase these physicians' interest in LL activities and the accessibility of these activities to them, including the availability of LL resources at home so physicians can get updates at their convenience. Primary care physicians should also be encouraged to become involved in teaching of any type, as this is a facilitating factor for LL activities.

## 1. Introduction

Acquiring a medical degree is only the beginning of a prolonged learning process. Medical schools provide the basic infrastructure of knowledge and skills. Formal studies continue during residency training and sometimes in subspecialty or fellowship programs that provide trainees with the necessary skills to perform more specific tasks. But at a certain point in time, "formal" structured studies end, and, in countries in which the recertification of physicians' skills and knowledge is not required, continuing education is left to personal initiative.

Hospitals have a long tradition of continuing medical education (CME) and professional updating that are integrated into the regular work schedule. This includes staff

meetings, radiology meetings, clinical-pathological meetings, and journal clubs. Community physicians usually work in solo or small group practices with a limited number of other physicians, and CME is not an integral part of their work schedule. The tradition of teaching and research in family medicine is a recent development, so it is much less established than in the hospital setting. As the focus of patient care moves to the community, the focus of CME should follow.

The ways in which physicians continue to update themselves at the end of their formal studies have been described using different terms, including self-directed learning, self-educative approach, self-initiative learning, active learning, independent learning, contextual learning, CME,

TABLE 1: Study population demography and physician practice characteristics ( $n = 979$ ).

	<i>n</i>	%
<b>Demographic characteristics</b>		
Age		
30–50	380	41.1%
51+	545	58.9%
Average ± st. dv.		$51.8 \pm 8.3$
Range		31–79
	925	(mis = 54)
Gender		
Male	509	53.4%
	954	(mis = 25)
Country of birth		
Israel	378	40.3%
East Europe and USSR	323	34.4%
Other	238	25.3%
	939	(mis = 40)
<b>Physician and practice characteristics</b>		
Graduated Medical School in		
Israel	344	36.5%
Other	598	63.5%
	942	(mis = 37)
Years as a physician		
1–10	47	5.3%
11–19	178	20.0%
20+	665	74.7%
Average ± st. dv.		$25.5 \pm 8.7$
Range		4–54
	890	(mis = 89)
Specialists in (more than one answer could be marked)		
Family physician	451	43.2%
Pediatrician	215	20.6%
Internal medicine	138	13.2%
General practitioner	151	14.5%
Geriatrician	22	2.1%
Other	67	6.4%
	1044	
Graduated specialty in		
Israel	700	86.0%
East Europe and USSR	55	6.8%
Other	59	7.2%
	814	(mis = 14)
Years as a specialist		
1–10	303	39.9%
11–19	218	28.7%
20+	239	31.4%

TABLE 1: Continued.

	<i>n</i>	%
Average ± st. dv.		$14.8 \pm 9.3$
Range		0–51
	760	(mis = 67)
Number of years in practice in primary care in Israel		
1–10	226	24.5%
11–19	397	43.1%
20+	298	32.4%
Average ± st. dv.		$17.4 \pm 8.7$
Range		1–50
	921	(mis = 58)
Teaching involvement		
Yes	333	36.5%
	913	(mis = 66)
Academic affiliation		
Yes	244	27.7%
	244	(mis = 97)
Were you a partner in planning/developing teaching programs?		
Yes	234	26.0%
	900	(mis = 79)
Characteristic of main working clinic		
Urban	640	66.7%
Rural	119	12.4%
Child health center	55	5.7%
Other	45	4.7%
	959	(mis = 20)
Position		
Head of clinic	166	17.4%
Primary physician	713	74.7%
Other	75	7.9%
	954	(mis = 25)
Number of population under your care (main clinic)		
≤1000	238	30.3%
1001–1500	292	37.2%
1500+	255	32.5%
Average ± st. dv.		$1520.5 \pm 1102.7$
Range		50–9500
	785	(mis = 194)
Other clinics you work at (more than one answer could be marked)		
Urban	294	62.3%
Rural	76	16.1%
Child health center	8	1.7%
Other	94	19.9%
	472	

TABLE 1: Continued.

	<i>n</i>	%
Number of hours seeing patients/week		
≤30	255	27.9%
31–45	574	62.7%
45+	86	9.4%
Average ± st. dev.	$34.1 \pm 10.5$	
Range	2–90	
	915	(mis = 64)
Average number of patients seen/day (7 hours)		
≤20	114	12.7%
21–35	309	34.3%
36–50	356	39.5%
51+	122	13.5%
Average ± st. dev.	$38.8 \pm 14.9$	
Range	4–110	
	901	(mis = 78)

and distance learning. Lately, all these have been included in one terminological basket under the rubric of lifelong learning (LL) [1].

Over the years, different tools have been developed to evaluate LL. In 1977, Guglielmino developed a Self-Directed Learning Readiness Scale (SDLRS) [2] that contained 58 Likert-like items such as "I love to learn." A short version of the SDLRS, which includes only 28 items from the original scale, was prepared by Bligh in 1993 [3]. Another scale to identify predictors of self-directed learning was developed by Oddi [4] in 1986, but subsequent studies did not provide consistent support for its validity [5, 6].

In 2003, Hojat et al. [1, 7] developed a tool to measure LL for physicians that had supporting psychometric evidence. A 37-item questionnaire was developed based on a review of the literature and the results of two pilot studies. Psychometric analyses of the responses of 160 physicians identified 19 items that were included in the final version of the Jefferson Scale of Physician Lifelong Learning (JSPLL).

Using this tool, we evaluated the characteristics of primary care physicians who have adopted LL as a professional principle. This information is especially important in countries like Israel where there is no legal requirement for CME or recertification, and self-initiative for LL remains the basis for assuring professional quality after formal medical studies end.

## 2. Methods

**2.1. Setting.** In Israel, a National Insurance Law was passed in 1995, which mandates the provision of health services through four Health Maintenance Organizations (HMOs). In 1970, Clalit Health Services (CHS), the largest HMO in Israel, provided primary care physicians working in community clinics with a paid work day for ongoing educational update

needs. The continuing education program is provided by the universities through CME schools [8]. Each physician working for the CHS has a clause in their contract that guarantees one paid CME day a week. The other HMOs offer a paid half-day or none at all, depending on the physician's contract. The Ministry of Health has not provided specific resources for long-term CME for physicians.

**2.2. Study Population.** The study included primary care physicians who have worked in the community setting for over two years and who work in a primary care setting for at least 15 hours per week. Primary care physicians are defined as general practitioners, pediatricians, family medicine specialists, internal medicine specialists, and geriatricians working in CHS community clinics (2,417 physicians), Maccabi Health Services (1,245 physicians), and Leumit Health Services (442 physicians).

**2.3. Study Tool.** A structured self-administered questionnaire was constructed for the participating physicians. It included the following.

- (1) The JSPLL, which assesses physicians' attitudes toward LL. The questionnaire was translated from English to Hebrew using the back-translation method [9] and was consequently culturally adapted. No validation tests were performed. It includes 19 items regarding basic elements of CME graded on a 4-point Likert scale (strongly disagree = 1, disagree = 2, agree = 3, and strongly agree = 4) [1]. The higher the score on the JSPLL, the greater the orientation toward lifelong learning. Factor analysis of the JSPLL depicts four sub-scales that are consistent with known characteristics of continuing education: (1) beliefs and motivation for professional learning, (2) educational activities, (3) recognition of educational opportunities, and (4) technical skills in searching for information [10]. The coefficient  $\alpha$  for this tool was 0.89, and the test-retest value was 0.91 [11]. The authors concluded that the four sub-scales of the JSPLL are relevant to the various aspects of CME, as described by others [10–14].
- (2) Physicians' characteristics: age, gender, number of years in primary care, medical school, and specialty.
- (3) Clinic characteristics: urban/rural, number of patients, solo practice/group practice, and number of visits/day.
- (4) CME activities: specific questions regarding frequency of activities, number of papers read/week, participation in specific lectures during the past year, and other activities.

**2.4. Data Collection.** Study questionnaires were mailed to physicians with a stamped addressed envelope for a return mail. A second mailing to physicians who did not complete the questionnaire was sent out after one month. In all, study questionnaires were mailed up to three times.

TABLE 2: Jefferson Scale of Physician Lifelong Learning (JSPLL) ( $n = 979$ ).

Please note the degree you agree with the following statements (1-strongly disagree; 4-strongly agree)	Mean	Std.	Median	<i>n</i>
Lifelong learning is a professional responsibility of all physicians	3.7	0.5	4	951
Rapid changes in medical science require constant updating of knowledge and development of new professional skills	3.7	0.5	4	959
I enjoy reading articles in which issues of my professional interest are discussed	3.6	0.5	4	956
I believe that I would fall behind if I stopped learning about new developments in my specialty	3.6	0.6	4	953
One of the important goals of medical school is to develop students' lifelong learning skills	3.6	0.6	4	956
I recognize my need to constantly acquire new professional knowledge	3.5	0.6	4	957
Searching for the answer to a question is, in and by itself, rewarding	3.3	0.7	3	905
I attend educational programs whether or not CME credit is offered	3.2	0.9	3	954
I take every opportunity to gain new knowledge/skills that are important to my profession	3.2	0.7	3	956
My preferred approach in finding an answer to a question is to search the appropriate computer databases	3.2	0.8	3	953

All participants gave their informed consent prior to participation in the study.

**2.5. Data Analysis.** Questionnaires were coded and entered in the study database using the Epidata 2.1 software. Data analysis was conducted with the SPSS 14.0 statistical software. Comparative one-way analysis was performed between different levels of LL (high versus low) using chi-square for categorical variables and ANOVA for continuous variables with  $P < 0.05$  set as statistically significant for all analyses. A logistic regression model was constructed to predict physicians with high LL scores, controlling for clinic and patient variables.

### 3. Results

**3.1. Study Population.** The questionnaires were mailed to 4,104 primary care physicians working at one of the three HMOs participating in the study, of whom 979 completed the questionnaire (23.9% response rate). No statistically significant differences were found between responders and nonresponders in terms of gender or years of employment at CHS. The majority of the study population was male (53.4%), with a mean age of  $51.8 \pm 8.3$  (range 31–79), and 40.3% was born in Israel. Table 1 depicts the sociodemographic characteristics of the participating physicians.

Among the responders, there were more males (52.5% versus 47.0%,  $P = 0.013$ ), and the group was younger ( $49.5 \pm 8.1$  versus  $50.5 \pm 8.1$ ,  $P = 0.017$ ). No differences were found in years of experience as a physician.

Physicians were asked to rate their reading and LL practices on a scale from 1–5.

The three most read sources were English journals ( $3.6 \pm 1.0$ ), free websites ( $3.4 \pm 1.2$ ), and Hebrew journals ( $3.3 \pm 1.0$ ). The three most frequent modalities for updating activities in the past year were scientific conferences ( $3.5 \pm 1.2$ ), clinical meetings in the clinic ( $3.4 \pm 1.5$ ), and meetings sponsored by pharmaceutical companies ( $3.3 \pm 1.2$ ).

Participants were asked to note the availability of updating resources they have access to at home, at the work

place, and in the medical library. The highest availability was defined as the resource being available both at home and at work. The leading resource noted was a computer with internet access (89.9%), followed by access to full-text publications (57.6%).

Participants were asked to rate their attitudes regarding who should be responsible for LL. There was a strong consensus that CME activities should be funded by the HMOs and/or hospitals ( $4.6 \pm 0.8$ ), that they should take place during regular working hours ( $4.0 \pm 1.3$ ), and that participants might have to pay for these activities ( $4.8 \pm 0.7$ ). There was a low degree of agreement that attending LL activities/CME courses should be a condition for recertification ( $2.8 \pm 1.4$ ) and that physicians should be trusted to study on their own without a need for CME courses ( $2.8 \pm 1.2$ ).

**3.2. The Jefferson Scale of Physician Lifelong Learning (JSPLL).** Table 2 depicts the results of the JSPLL questionnaire regarding the LL habits of the participating physicians. Of the 979 physicians who responded, 828 completed the full questionnaire. The mean score was  $57.7 \pm 7.5$  (of a maximum of 76). Based on these results, three groups were identified: (1) the bottom third with a low LL activity level (score 33–54), (2) a middle activity level (54–61), and (3) an upper third with a high LL activity level (62–76).

Physicians with high and low LL scores were compared. A comparison of demographic characteristics appears in Table 3. The high LL group included significantly more males (50.8% versus 49.2%,  $P = 0.03$ ), Israeli-born physicians (54.5% versus 45.5%,  $P < 0.01$ ), graduates from Israeli medical schools (54.0% versus 46.0%,  $P < 0.01$ ), physicians involved in teaching (70.3% versus 29.7%,  $P < 0.0001$ ), physicians with an academic affiliation (71.4% versus 28.6%,  $P < 0.0001$ ), physicians who participated in the development of educational programs (74.0% versus 26.0%,  $P < 0.001$ ), and physicians who held a position as a clinic director (65.3% versus 34.7%,  $P < 0.001$ ).

Physicians with higher scores were significantly more likely to have rated each of the different reading sources,

TABLE 3: Comparison of demographic and practice characteristics between physicians with high\* and low\*\* JSPLL scores ( $N = 255$  versus  $N = 288$ ).

	JSPLL lower third scores ( $N = 288$ )		JSPLL upper third scores ( $N = 255$ )		Total	<i>P</i> value
	<i>N</i>	%	<i>N</i>	%		
<b>Age</b>						
30–50	112	53.8%	96	46.2%	208	
51+	153	50.7%	149	49.3%	302	
Average ± st. dv.	$51.87 \pm 8.74$		$51.86 \pm 7.65$		0.993	
Range	32–79		32–68			
	265	(mis = 23)	245	(mis = 10)	510	
<b>Gender</b>						
Male	150	49.2%	155	50.8%	305	
	282	(mis = 6)	248	(mis = 7)	530	0.031
<b>Country of Birth</b>						
Israel	110	45.5%	132	54.5%	242	
East Europe and USSR	89	61.4%	56	38.6%	145	0.007
Other	74	55.6%	59	44.4%	133	
	273	(mis = 15)	247	(mis = 8)	520	
<b>Years in Israel</b>						
≤10	7	70.0%	3	30.0%	10	
10+	142	56.8%	108	43.2%	250	
Average ± st. dv.	$27.11 \pm 13.82$		$27.91 \pm 13.02$		0.313	
Range	6–70		8–91			
	149	(mis = 14)	111	(mis = 4)	260	
<b>Graduated Medical School in</b>						
Israel	108	46.0%	127	54.0%	235	
Other	170	59.0%	118	41.0%	288	0.009
	278	(mis = 10)	245	(mis = 10)	523	
<b>Years as a physician</b>						
1–10	14	51.9%	13	48.1%	27	
11–19	48	49.5%	49	50.5%	97	
20+	196	53.1%	173	46.9%	369	0.815
Average ± st. dv.	$25.71 \pm 8.92$		$24.82 \pm 8.41$			
Range	5–54		6–45			
	258	(mis = 30)	235	(mis = 20)	493	
<b>Specialists in (more than one answer could be marked)</b>						
Family physician	132	50.8%	128	49.2%	260	0.176
Pediatrician	61	50.4%	60	49.6%	121	0.29
Internal medicine	41	51.3%	39	48.8%	80	0.41
General practitioner	43	65.2%	23	34.8%	66	0.024
Geriatrician	4	36.4%	7	63.6%	11	0.345
Other	12	29.3%	29	70.7%	41	0.001
	293		286		579	
<b>Graduated specialty in</b>						
Israel	204	48.8%	214	51.2%	418	
Abroad	29	61.7%	18	38.3%	47	0.09
	233	(mis = 12)	232		465	

TABLE 3: Continued.

	JSPLL lower third scores (N = 288)		JSPLL upper third scores (N = 255)		Total	P value
	N	%	N	%		
<b>Years as a specialist</b>						
1–10	86	52.8%	77	47.2%	163	
11–19	66	47.8%	72	52.2%	138	
20+	68	48.2%	73	51.8%	141	0.629
Average ± st. dv.	14.72 ± 9.35		15.21 ± 8.48			
Range	1–51 220 (mis = 25)		1–37 222 (mis = 10)		442	
<b>Number of years in practice in primary care in Israel</b>						
1–10	64	54.2%	54	45.8%	118	
11–19	121	57.1%	91	42.9%	212	
20+	94	50.5%	92	49.5%	186	0.426
Average ± st. dv.	17.44 ± 8.74		18.19 ± 8.63			
Range	1–50 279 (mis = 9)		2–40 237 (mis = 18)		516	
<b>Teaching involvement</b>						
Yes	65	29.7%	154	70.3%	219	
	277	(mis = 11)	242	(mis = 13)	519	<0.0001
<b>Academic affiliation</b>						
Yes	46	28.6%	115	71.4%	161	
	272	(mis = 16)	233	(mis = 22)	505	<0.0001
<b>Were you a partner in planning/developing teaching programs?</b>						
Yes	40	26.0%	114	74.0%	154	
	270	(mis = 18)	237	(mis = 18)	507	<0.0001
<b>Position</b>						
Head of clinic	35	34.7%	66	65.3%	101	
Primary physician	231	59.7%	156	40.3%	387	
Other	14	33.3%	28	66.7%	42	<0.0001
	280	(mis = 8)	250	(mis = 5)	530	
<b>Characteristic of main working clinic</b>						
Urban	232	57.9%	169	42.1%	401	
Rural/kibbutz	34	45.3%	41	54.7%	75	
Child health center	9	27.3%	24	72.7%	33	
Other	10	35.7%	18	64.3%	28	
	285	(mis = 3)	252	(mis = 3)	537	
<b>Position</b>						
Head of clinic	35	34.7%	66	65.3%	101	
Primary physician	231	59.7%	156	40.3%	387	
Other	14	33.3%	28	66.7%	42	
	280	(mis = 8)	250	(mis = 5)	530	<0.0001
<b>Number of population under your care (main clinic)</b>						
≤1000	69	54.8%	57	45.2%	126	
1001–1500	92	57.9%	67	42.1%	159	

TABLE 3: Continued.

	JSPLL lower third scores (N = 288)		JSPLL upper third scores (N = 255)		Total	P value
	N	%	N	%		
1500+	73	46.5%	84	53.5%	157	0.115
Average ± st. dv.	1433.35 ± 880.15		1603.85 ± 1203.89			
Range	80–8000		60–9999			
	234	(mis = 54)	208	(mis = 47)	442	
Other clinics you work at (more than one answer could be marked)						
Urban	85	49.1%	88	50.9%	173	0.212
Rural/kibbutz	17	48.6%	18	51.4%	35	0.584
Child health center	0	0.0%	4	100.0%	4	0.048
Other	20	34.5%	38	65.5%	58	0.003
	288		255		543	
Number of hours seeing patients/week						
≤30	78	49.4%	80	50.6%	158	
31–45	167	54.6%	139	45.4%	306	0.566
45+	25	53.2%	22	46.8%	47	
Average ± st. dv.	33.86 ± 10.64		32.92 ± 11.03			
Range	5–65		2–60			
	270	(mis = 18)	241	(mis = 14)	511	
Average number of patients seen/day (7 hours)						
≤20	36	52.9%	32	47.1%	68	
21–35	89	50.9%	86	49.1%	175	
36–50	103	53.4%	90	46.6%	193	0.467
51+	44	62.0%	27	38.0%	71	
Average ± st. dv.	39.86 ± 15.90		37.41 ± 15.16			
Range	6–100		5–100			
	272	(mis = 16)	235	(mis = 20)	507	

\*High JSPLL score-upper third score (high LL activities score: 62–76).

\*\*Low JSPLL score-bottom third score (low LL activities score: 33–54).

participated in more update meetings, and utilized each of the data sources to a greater degree (Table 4).

If the updating resource was accessible both at work and at home, it was rated as highly available. For each of the updating resources, higher availability was noted for physicians in the upper third LL group. In addition, the physicians in the upper third LL group strongly agreed that CME activities should be funded by the HMOs and/or hospitals (4.68 versus 4.48,  $P < 0.01$ ) and that CME should be a condition for recertification (3.1 versus 2.5,  $P < 0.0001$ ).

A logistic regression model was constructed to predict physician characteristics that correlate with higher LL scores. The independent variable was having an upper third score in the JSPLL questionnaire. The dependent variables included in the model were: male gender (OR = 1.501, 95% CI 1.044–2.159), involvement in teaching (OR = 4.460, 95% CI 3.084–6.448), and a rural clinic as the main work setting (OR = 0.601, 95% CI 0.421–0.856). The number of years working in primary care in Israel, the number of patients

seen, the number of hours spent seeing patients a week, and specialty status were not included in the final model. The variable, years in practice, was also not included as it had a high degree of correlation with physician age (Table 5).

#### 4. Discussion

Hospitals have a long tradition of CME activities that are an integral part of the regular working schedule, while primary care physicians work in solo or group practices, and CME activities are usually not included in their regular working hours. Thus, it is important to understand which CME activities are available in the primary care setting.

Since the response rate in our study was only 23.9%, it might be assumed that the study sample does not represent the study population. The response rate may have been higher among physicians who do participate in CME (and may represent particular age and gender groupings), so that

TABLE 4: Comparison of the updating habits of the lower and upper third respondents ( $N = 255$  versus  $N = 288$ ).

	JSPLL bottom third scores ( $N = 288$ )				JSPLL upper third scores ( $N = 255$ )				<i>P</i> value
	Mean	Std.	Median	<i>N</i>	Mean	Std.	Median	<i>N</i>	
Reading update (1-not at all; 5-very much)									
Professional textbooks	2.68	0.98	3	277	3.48	1.03	3	249	<0.0001
Hebrew journals	3.09	0.93	3	283	3.61	1.11	4	248	<0.0001
Foreign language journals	3.15	1.02	3	279	4.18	0.86	4	249	<0.0001
Pharmaceutical companies publications	2.63	0.97	3	277	2.82	1.1	3	240	0.039
Membership-based internet sites (exp. MD consult)	2.67	1.34	3	276	3.92	1.23	4	249	<0.0001
Nonmember-based internet sites (exp. medscape)	3.01	1.22	3	280	3.98	1.12	4	250	<0.0001
Self-learning CD	1.58	0.94	1	269	2.05	1.26	2	244	<0.0001
IMA guidelines	2.87	1.19	3	276	3.63	1.12	4	248	<0.0001
To what degree did you participate in the following updates during the <i>past year</i> (1-not at all; 5-very much)									
CME courses (weekly meetings)	2.93	1.78	3	275	3.3	1.79	4	240	0.021
CME minicourses	2.22	1.41	1	257	2.89	1.62	3	239	<0.0001
Scientific conferences	3	1.23	3	275	4.18	1.04	5	248	<0.0001
Clinical meetings in the clinic	2.91	1.45	3	270	3.79	1.36	4	234	<0.0001
Clinical meetings in the hospital	1.92	1.27	1	251	2.9	1.67	3	232	<0.0001
Lectures at the hospital/clinic/university	2.58	1.33	3	264	3.72	1.35	4	244	<0.0001
Pharmaceutical companies sponsored meetings	3.13	1.21	3	279	3.34	1.28	3	250	0.052
Accompanying physician (working alongside a specialist consultant)	1.89	1.33	1	247	2.29	1.66	1	212	0.001
Evaluate the frequency you utilize the following data sources when encountering a diagnostic/treatment problem (1-not at all; 5-very much)									
Books	3.23	1.16	3	278	3.54	1.2	4	251	0.002
Journals	2.9	1.09	3	275	3.9	1.09	4	251	<0.0001
Computerized database	3.92	1.1	4	277	4.74	0.61	5	253	<0.0001
Colleagues at the clinic	3.23	1.23	3	272	3.58	1.24	4	248	0.001
Consultation with a specialist	3.89	1.01	4	279	4.1	0.97	4	253	0.013
Sales representative of a pharmaceutical company	1.96	1.05	2	274	1.98	1.14	2	250	0.801
Circulation from the medical management of the HMO	2.67	1.15	3	276	2.94	1.19	3	245	0.01

the rate of CME activity may be even lower among those who did not participate. If so, the need for remedial action is even greater. Nevertheless, a study population of 979 physicians, who come from three of the four HMOs in Israel, can provide, at the least, a partial picture of attitudes towards LL among primary care physicians in Israel.

Defining the characteristics of those who have a stronger propensity for LL does not necessarily lead to a course of action that would increase this inclination in others. In many countries, women take most of the responsibility for and burden of raising children and caring for the family [15]. This could lead to a conflict between home and work among female physicians [16] and affect both their interest and opportunity to take part in LL activities. Thus, ways should be sought to encourage female physicians to participate in relevant CME activities and develop LL habits.

A large number of Israeli students study outside of Israel. In many cases, they are likely to have lower LL scores, so this group should also be encouraged, through incentives, to develop LL skills and habits through remedial programs within residency programs.

In a study from Israel, an outcome-based CME program addressed and tried to solve the singular needs of practicing immigrant physicians [17]. This type of program could also lead to increased LL activity.

Factors associated with higher LL scores included involvement in teaching, having an academic affiliation, and/or holding a position as a clinic director. However, these factors are often inherent characteristics that are not fostered by training programs. Still, encouraging physicians to engage in academic activities can lead to positive outcomes. HMOs should encourage physicians' access to university academic

TABLE 5: Logistic regression results for predicting physicians that will be in the upper third of the JSPLL questionnaire ( $N = 979$ ).

Variables included	Odds ratio	CI 95%	P value
Age (continuous)	1.019	0.996–1.042	0.103
Gender			
Male	1.501	1.044–2.159	0.028
Female	1		
Country of medical school			
Israel	1.381	0.961–1.986	0.081
Abroad	1		
Involved with teaching			
Yes	4.46	3.084–6.448	<0.0001
No	1		
Main clinic			
Other	0.601	0.421–0.856	0.005
Urban	1		

departments. It might also be beneficial to identify factors that encourage LL in rural practices and try to adopt them like in urban settings.

The degree of availability of various update modalities is also important. Physicians with high LL scores had greater accessibility to each of the update modalities both at home and at work. It is not surprising that the availability of CME resources and the allocation of time for LL activities during working hours were associated with higher LL activity. Policymakers should find ways to increase accessibility to free LL activities at home and at work in order to enhance LL options.

In a Cochrane review on the effects of CME meetings and workshops on professional practice and health care outcomes [18], the authors concluded that educational meetings alone or combined with other interventions can improve professional practice and the achievement of treatment goals by patients. Studies in medical education have focused primarily on whether continuing education activities are effective in creating a change in the treatment approaches of physicians and improving the health outcomes of patients. A review paper that compared the effect of formal CME teaching (lectures, presentations, and printed materials) with interactive CME programs showed that formal methods had little to no effect, while interactive programs had a medium to high effect [19]. In our study the three most frequent formats for LL were scientific conferences, clinical meetings in the clinic, and meetings sponsored by pharmaceutical companies. Of these, the latter should be the one of greatest concern to us. The current literature on the relationship between the pharmaceutical industry and the medical profession is remarkably consistent [20]. Doctors (and medical students) are influenced by contact with industry, but they incorrectly believe that they are immune to its effects or that they are capable of identifying and averting the danger of any inappropriate bias and influence [21, 22]. Therefore, policy makers should look for ways to allocate funds for CME activities, with the aim of “protecting” physicians from

their tendency to depend on pharmaceutical companies for funding.

## 5. Conclusions

Davis et al. [23] suggested that leaders in medical education and related fields should identify high-priority research topics in CME research with the aim of expanding the scope of CME and conducting rigorous scientific studies on the process and effectiveness of CME. Successful research on this topic could provide us with ways to improve all aspects of CME. The results of such research could help policymakers formulate ways to increase physician participation in LL activities and maintain or improve their knowledge, skills, and attitudes even if a long time has passed from the conclusion of their formal medical studies. Further studies should be performed on the contribution of CME to clinical outcomes.

## Ethical Approval

The study received IRB approval from the Meir Medical Center, Kfar Saba, Israel. The work was conducted in accordance with the Declaration of Helsinki (1964).

## Conflict of Interests

The authors declare that they have no conflict of interests.

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