

Learning in practice

Postal survey of approaches to learning among Ontario physicians: implications for continuing medical education

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Abstract

Objectives To understand the approaches to learning of practising physicians in their workplace and to assess the relation of these approaches to their motivation for, preferred methods of, and perceived barriers to continuing medical education.

Design Postal survey of 800 Ontario physicians.

Participants 373 physicians who responded.

Main outcome measures Correlations of approaches to learning and perceptions of workplace climate with methods, motives, and barriers to continuing medical education.

Results Perceived heavy workload was significantly associated with the surface disorganised ($r=0.463$, $P<0.01$) and surface rational approach ($r=0.135$, $P<0.05$) to learning. The deep approach to learning was significantly correlated with a perception of choice-independence and a supportive-receptive climate at work ($r=0.341$ and 0.237 , $P<0.01$). Physicians who adopt a deep approach to learning seem to be internally motivated to learn, whereas external motivation is associated with surface approaches to learning. Heavy workload and a surface disorganised approach to learning were correlated with every listed barrier to continuing medical education. The deep approach to learning was associated with independent learning activities and no barriers.

Conclusions Perception of the workplace climate affects physicians' approaches to learning at work and their motivation for and perceived barriers to continuing medical education. Younger, rural, family physicians may be most vulnerable to feeling overworked and adopting less effective approaches to learning. Further work is required to determine if changing the workplace environment will help physicians learn more effectively.

Introduction

Doctors face enormous challenges in managing the growth of knowledge throughout their careers. Medical schools have responded by developing methods to foster independent self directed lifelong learning. Regulatory bodies are also increasingly concerned with assessing continuing medical education in order to ensure the continued competence of physicians to practice.¹

These forces have focused attention on the effectiveness of continuing medical education. Didactic lectures, which are a familiar part of undergraduate medical education, are not effective in changing doctors' behaviour.² New techniques have therefore been developed to facilitate learning.³⁻⁴ Although many physicians participate in these activities, it is not clear how effective they are for individual physicians.

Approaches to learning and the complex interaction of the environment, personal factors, and opportunities are known to affect undergraduate learning.⁵⁻⁸ Knapper studied the effect of the workplace environment on learning of students in work-study programmes.⁹ He found that the workplace promoted a deep approach to learning (box). The achieving approach to learning (competitive and focusing on achieving high grades) found in university students was not evident in the workplace and surface approach to learning (rote memorisation, lack of understanding) divided into surface rational and surface disorganised approaches.¹⁰

Kirby et al adapted items from Ramsden and Entwistle's course perceptions questionnaire to examine variations in perceptions of the workplace climate.^{7 10 11} Three factors emerged, reflecting perceptions of good supervision, choice-independence, and heavy workload (box). Items indicating that supervisors

Definitions

Approaches to work

Surface disorganised—Feeling overwhelmed by work. For example, being unsure what is needed to complete a task, finding it difficult to organise time effectively, reading things without really understanding them

Surface rational—Preference for order, detail, and routine. For example, likes to know precisely what is expected, puts a lot of effort into memorising important facts when learning something new

Deep approach—Integrative approach that leads to personal understanding. For example, tries to relate new ideas to situations where they might apply

Workplace climate

Choice-independence—Perception of control over what one does and how one does it

Supportive-receptive—Perception that help is available in the workplace and colleagues are understanding

Workload—Perception of heavy workload and having to cope alone

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The questionnaire is available on bmj.com

Table 1 Age and sex of respondents and whole random sample population

	Respondents (n=346)		Sample population (n=800)*	
	Family physicians	Specialists	Family physicians	Specialists
Mean (range) age (years)	41 (26-63)	46 (31-73)	43	47
No (%) of total	157 (45)	189 (55)	408 (51)	392 (49)
No (%) of men	107 (68)	130 (69)	298 (73)	278 (71)
No (%) of women	50 (32)	59 (31)	110 (27)	114 (29)

*Age range 25-83.

tried to understand and help employees and took their ideas seriously defined good supervision. Good supervision and choice-independence were positively associated with the deep approach and negatively associated with the surface disorganised approach to learning. Workload was strongly related to the surface disorganised approach. The questionnaires used in these studies showed Chronbach's α reliabilities for the six scales ranging from 0.71 to 0.87.¹⁰

The deep approach to learning is thought to lead to improved understanding and knowledge.^{5,6} There is little empirical research to show that this is the approach used by practising physicians. If the factors that affect physicians' learning were known, providers of undergraduate and continuing medical education could improve the conditions for effective learning, including organisation of work and the development of skills for lifelong learning. In this study we examined the relations between approaches to learning at work of practising physicians and perceptions of the workplace climate to determine how these variables affect their motivation for, methods of, and perceived barriers to continuing medical education.

Participants and methods

We revised the workplace learning questionnaire for use by practising physicians (appendix).¹⁰ Because most physicians work independently, we modified the good supervision scale and relabelled it as the supportive-receptive climate scale. We piloted the questionnaire to ensure it was understandable and that items related to their intended constructs. Two items intended to measure choice-independence ("The work I am doing now will be a good preparation for career opportunities elsewhere, should I ever leave" and "The work I am doing now will definitely improve my future employment prospects") were not relevant to most physicians. We therefore eliminated these from the final version. There were 10 items each for the approaches to learning constructs and five items per workplace climate construct apart from the choice-independence scale (three items).

We asked physicians to rate their most valued continuing medical education activities, barriers to, and motivations for continuing medical education on a five point scale ranging from "agree strongly" (5) to "disagree strongly" (1). The learning activities were categorised into consultations, independent learning (reading journals, literature searches, reading a textbook, and searching the internet), standard continuing medical education (workshops and conferences) and problem based learning. The motivations for continuing medical education were categorised as internal ("the pleasure of learning something new"), external ("the requirements of my professional college," "fear of a lawsuit"), and professional

competence ("the need to maintain my competence," "unfamiliar patient problems"). Queen's University research ethics board approved the project.

Data collection

We sent questionnaires to a random sample of 800 Ontario physicians.¹² A reminder postcard was sent to non-respondents after two weeks and the complete package resent after one month.¹³ We needed 240 participants for a reliable factor analysis, eight per item for the 30-item scale.

Results

Of the 390 surveys returned, 17 were undeliverable and 27 had greater than 10% missing data, leaving 346 for analysis. The proportions of specialists, women, and younger physicians responding were slightly higher than those in the population surveyed (table 1). Specialists worked predominantly in urban settings, whereas just over half of family physicians worked in rural settings (table 2). Most physicians (208, 60%) worked 40-60 hours a week, 48 (14%) more than 60 hours a week, and 90 (26%) less than 40 hours a week.

Principal axis factor analysis indicated that the modified workplace learning questionnaires had the same factor structure as found in previous studies.¹⁴ Cronbach's α reliabilities ranged from 0.56 to 0.74 (table 3).

The mean score for the surface disorganised approach to learning (2.72) was substantially lower than the means for the surface rational or deep approaches (3.33 and 3.59; table 3). The size of the differences suggests that physicians are more likely to agree that they learn either for understanding or in an orderly or logical approach to solve a problem. They are more likely to disagree with statements about learning in a disorganised, superficial manner, overwhelmed by the task.

Table 2 Characteristics of practice for family physicians and specialists

	No of family physicians (n=157)	No of specialists (n=189)
Type of practice*		
Group	73	48
Singlehanded	55	89
Hospital	38	69
Academic	10	42
Location of practice		
Urban	62	183
Rural and remote	80	21

*Some physicians fitted more than one category.

Table 3 Mean (SD) scores and α coefficients for scales from the approach to work and workplace climate questionnaires (based on 373 returned questionnaires)

	Mean (SD) score	α coefficient
Approaches to learning in workplace:		
Surface rational	3.33 (0.46)	0.74
Surface disorganised	2.72 (0.48)	0.63
Deep	3.59 (0.41)	0.68
Workplace climate:		
Choice-independence	3.57 (0.73)	0.68
Workload	3.7 (0.63)	0.70
Supportive-receptive	3.3 (0.53)	0.56

Family physicians, physicians from rural or remote practices, and those who had undergraduate problem based learning had higher surface disorganised learning scores than other groups (table 4). Rural and remote practice location was associated with higher workload scores.

Correlations

Perceptions of high workload were associated with higher scores on the surface disorganised scale, whereas choice-independence and supportive-receptive climate were associated with a deep approach to learning (table 5). The only significant correlation between the scales and age or sex, was a negative correlation of 0.23 ($P < 0.05$) between age and the scores on the surface disorganised scale, implying that inexperience or immaturity may interfere with learning early in the career.

Independent learning activities and internal motivation for continuing medical education were most highly correlated with a deep approach to learning (table 6). The surface disorganised approach was correlated with external motivation and the surface rational approach was correlated with many factors. Workload was associated with preference for consultations, external motivation, and professional compe-

tence motivation. Table 7 shows the correlations of barriers to continuing medical education activities with the approaches to learning and workplace climate scales. The most striking finding was that the surface disorganised approach and workload were positively correlated with every barrier to continuing medical education listed. Perception of the workplace as providing choice-independence or a supportive-receptive climate was negatively related to several of the barriers.

Discussion

Most physicians take either a deep or a surface rational approach to learning at work. The deep approach indicates the intent to understand and reflect on knowledge that should affect practice behaviours. The surface rational approach may be appropriate in some situations, such as solving a pressing patient problem.¹⁰ It is a concern, however, that some physicians seem disorganised in their approach to learning at work.

The relation between perception of heavy workload and surface disorganised approaches to learning among physicians is consistent with studies in other workplace situations.¹⁰⁻¹⁴ Physicians who adopt a deep approach perceive choice and independence in the

Table 4 Differences in mean (SD) scores for approaches to learning and workplace climate according to type of physician, undergraduate curriculum, and location of practice

Scale	Type of physician			Curriculum			Location		
	Family physician (n=157)	Specialist (n=189)	P value for difference	Problem based learning (n=162)	Traditional (n=183)	P value for difference	Urban (n=244)	Rural and remote (n=100)	P value for difference
Approach to learning:									
Deep	3.61 (0.45)	3.57 (0.40)	0.33	3.63 (0.41)	3.56 (0.44)	0.09	3.56 (0.40)	3.60 (0.44)	0.42
Surface rational	3.36 (0.48)	3.28 (0.48)	0.11	3.34 (0.47)	3.31 (0.47)	0.55	3.33 (0.50)	3.33 (0.45)	0.98
Surface disorganised	2.81 (0.74)	2.68 (0.71)	0.02	2.80 (0.49)	2.69 (0.47)	0.04	2.69 (0.48)	2.84 (0.46)	0.008
Workplace climate:									
Supportive-receptive	3.33 (0.51)	3.26 (0.57)	0.19	3.34 (0.57)	3.26 (0.50)	0.14	3.34 (0.53)	3.28 (0.54)	0.37
Choice-independence	3.61 (0.74)	3.49 (0.71)	0.13	3.55 (0.72)	3.56 (0.74)	0.88	3.48 (0.68)	3.59 (0.75)	0.19
Workload	3.71 (0.62)	3.78 (0.66)	0.36	3.71 (0.63)	3.77 (0.64)	0.44	3.68 (0.64)	3.89 (0.61)	0.005

Table 5 Correlations between approaches to learning at work and workplace climate (based on 373 returned questionnaires)

	Approaches to learning			Workplace climate		
	Surface rational	Surface disorganised	Deep	Choice-independence	Workload	Supportive-receptive
Approach to learning:						
Surface rational	1.00					
Surface disorganised	0.131**	1.00				
Deep	-0.032	-0.024	1.00			
Workplace climate:						
Choice-independence	-0.012	-0.171**	0.341**	1.00		
Workload	0.135*	0.463**	0.103	-0.112*	1.00	
Supportive-receptive	0.029	-0.107*	0.237**	0.299**	-0.182**	1.00

* $P < 0.05$, ** $P < 0.01$.

Table 6 Correlations of approaches to work and workplace climate with methods of continuing medical education and motivations

	Approaches to learning			Workplace climate		
	Surface rational	Surface disorganised	Deep	Choice-independence	Workload	Supportive-receptive
Consultations	0.030	0.114*	0.026	0.046	0.141**	-0.009
Independent learning	0.171**	-0.016	0.340**	0.022	0.046	0.127*
Standard	0.104	0.022	0.043	0.084	0.031	0.073
Problem based learning	0.048	0.037	0.133*	-0.034	0.125*	0.001
External motivation	0.246**	0.259**	-0.102	-0.125*	0.211**	-0.079
Professional competence	0.149**	0.094	0.156**	-0.057	0.230**	-0.012
Internal motivation	0.155**	-0.058	0.404**	0.144**	0.084	0.028

* $P < 0.05$, ** $P < 0.01$.

Table 7 Correlations of approaches to learning and workplace climate with barriers to continuing medical education

Barriers	Approaches to learning			Workplace climate		
	Surface rational	Surface disorganised	Deep	Choice-independence	Workload	Supportive-receptive
Cost	0.153**	0.181**	-0.068	-0.229**	0.150**	-0.163**
Time	0.095	0.314**	-0.061	-0.186**	0.401**	-0.137
Access to information resources	0.164**	0.308**	0.049	-0.060	0.194**	-0.113
Distance to conferences	0.102	0.183**	0.106*	-0.089	0.187**	-0.041
Finding replacements/coverage	0.071	0.273**	-0.057	-0.186**	0.264**	-0.130*
Tailored to fit needs	0.076	0.249**	0.124*	0.012	0.226**	-0.028
Practice responsibilities	0.108*	0.237**	0.035	-0.172**	0.352**	-0.098

*P<0.05, **P<0.01.

workplace and a supportive-receptive atmosphere. Although we cannot determine causation from this study, studies of undergraduate students indicate that the learning environment affects the approach to learning, independent of the preferred learning style.^{7 15-17} Yet medical students with a deep approach to learning were more likely to take an intercalated degree and pursue a career in research or laboratory medicine, indicating that their approach to learning may affect the environment they choose.¹⁸

Family physicians and younger and rural hospital physicians had higher scores on the surface disorganised scale, and rural physicians scored more highly on the workload scale. Clearly, overworked young primary care physicians in isolated environments may be most vulnerable to ineffective approaches to learning at work. New British general practitioners were found to need support early in their careers to avoid stress and negative personal impact on their careers.¹⁹ Further studies are needed to determine whether changing the work environment can aid learning and support new physicians. External motivators for learning by regulatory bodies are unlikely to lead to effective learning in overloaded physicians.

Motivation

Motivation for learning is complex. Miller and colleagues found that motivation to learn in both new and experienced physicians was unstable and related to external factors.²⁰ We found a strong association between a deep approach to learning and internal motivation for learning, although desire for professional competence is an important driver. Although the surface rational approach is associated with mixed motives, the unique relation between the surface disorganised approaches to learning and external motivation for continuing medical education is a concern. The association of external motivation and professional competence motivation with perception of heavy workload suggests that the stress of work may stimulate or inhibit learning. Physicians may have mixed motives. These may not interfere with participation in continuing medical education activities but may affect how physicians learn within the activity.

Limitations

The response rate in this study does not allow generalisation. Although the respondents were similar demographically to the non-respondents, we do not know how the non-respondents differed. It is likely that physicians who feel overworked did not respond since some respondents questioned the purpose and objected to the length of the workplace learning questionnaire. The focus of the study was to show the

What is already known on this topic

Throughout their careers physicians face enormous challenges in managing the growth of medical knowledge

Students who perceive choice, independence, and good teaching at university take a deep, integrative approach to learning whereas those who feel overworked or overwhelmed tend to learn by rote

What this study adds

Feeling overwhelmed at work is associated with a disorganised and superficial approach to learning and perception of many barriers to continuing medical education

Physicians who believe they have choice, independence, and support in their work take a deep approach to learning, are internally motivated, and use independent learning methods

Younger, rural, and family physicians are most likely to feel overworked

patterns of relations. These patterns suggest that attention to environments and different activities will be needed for effective learning among different physicians. Further studies are needed to confirm these findings and the reliability of the workplace learning questionnaire.

The significant correlations found in this study were less than 0.5. The complex interactions that influence learning at work mean that modification of any single factor, such as cost or access to information resources would have little effect. We need to understand the numerous influences to help physicians organise their learning in practice.

Conclusions

The deep approach to learning adopted by most physicians in this study is correlated with a sense of choice and independence and a supportive-receptive workplace climate, internal motivation for learning, independent learning activities, and no perceived barriers to continuing medical education. In contrast, a perception of overwork is associated with a surface disorganised approach to learning, external motivation, and perception of many barriers to continuing medical education. Further study is needed to determine if attention to the practice environment can aid physicians in their learning, particularly younger, rural, family physicians.

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