Canadian Medical Education Journal

Editorial

Closing out 10 years

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This issue marks a historical point in the life of the CMEJ: this is the final issue in our 10th year of publication. This issue's artwork, Head, by O'Neill, used small objects to create a larger, coherent picture similar in style to pointillism. It reminds me of the broad sweep of CMEJ history: understanding many of the events over the first 10 years requires stepping back and seeing the patterns from a distance. From the humble beginnings in 2010, CMEJ has grown from publishing two issues and 90 pages per year to now publishing up to four issues and more than 400 pages per year. The number of days it takes us to give an initial decision went from over 200 to well under 100 even while the number of submissions has increased from 25 per year in the early years to over 150. We now translated all abstracts to make them available in both languages and so more legitimately lay claim to being a Canadian journal. We have moved from a University of Calgary-based publication to a self-publishing academic journal managed by a consortium of five national medical education organizations (The Association of Faculties of Medicine Canada, The Canadian Association for Medical Education, The College of Family Physicians Canada, The Medical Council of Canada, and The Royal College of Physicians and Surgeons). For years our funding was patched together, but now with a three-year grant from the Social Science and Humanities Research Council (Aid to Scholarly Journals) and a solid business plan, we have greater financial stability and respected governance. Each event and accomplishment in our history, however small it may seem, has brought us closer to our goal of being a pre-eminent medical education journal for Canadian scholars and scholarship.

As we continue to grow and expand, new and exciting things are on the horizon for CMEJ. I look forward to the adventures as this journal enters its second decade of scholarly activity in medical education.

In this issue we present a varied array of topics and formats, all interesting studies that can help move medical education forward.

"Does watching a movie improve empathy? A cluster randomized controlled trial" by Ahmadzadeh et al is a study that examined how watching a movie about the patient-physician relationship alone or in combination with a three-hour communication skills training workshop improved the empathy scores of medical students. One hundred and thirty-three medical students participated in one of four groups. The authors used a linear mixed effect model to analyze the effect of intervention across groups considering the effects of other significant variables. All three intervention groups showed an immediate positive effect on empathy scores. However, the improvement effect remained significant only in two of the groups one month later, one of which was the movie and workshop combined.

"Medical Assistance in Dying: the opinions of medical trainees in Newfoundland and Labrador. A cross-sectional study" by McCarthy and Seal explored the opinions of medical trainees in Newfoundland and Labrador regarding MAiD. They distributed a survey to all 570 under- and post-graduate medical trainees at Memorial University. Of the 124 trainees who completed the survey (response rate of 21.8%), 90% supported the legalization of MAiD in Canada. While nearly 60% stated they would serve their patients' wishes, they also favoured assisted suicide over active euthanasia. Level of training and religious affiliation were associate with support for MAiD.

"Disadvantaged patient populations: a theory-informed education needs assessment in an urban teaching hospital" by Baker and her team used a critical discourse analysis to explore the meanings and effects of disadvantaged patient populations (DPP). They analyzed transcripts from 15 focus groups with trainees, staff, and patients and learned that 1) disadvantaged patients require care above what is normal; 2) the system is to blame for failures in serving disadvantaged patients; and 3) labeling patients is problematic and stigmatizing. Patients both appreciated that the DPP label allowed better access to care, but also felt "othered" at the same time. They suggested theory-informed educational practices to help improve care for DPP.

"Assessing the quality of feedback to general internal medicine residents in a competency-based environment" by Marcotte and her team describe their investigation of the quality of feedback in General Internal Medicine (GIM), by comparing workplace-based assessment (WBA) and In Training Evaluation Reports (ITERs). They predicted that WBAs would improve feedback to support the development of competence. Over a three-year period, they gathered data from focus groups, interviews, and surveys that compared WBA and ITERs. Overall rates of actionable feedback, for both ITERs and WBAs were low (26%), with only 9% of the total providing an improvement strategy. They found that residents and preceptors both believed the narrative component of feedback was more constructive and effective than numerical scores.

"Managing cognitive load in simulations: exploring the role of simulation technologists" written by Sibbald and team used cognitive load theory to explore the impact of technologists on instructors, identifying sources of instructor cognitive load with and without a technologist present. They collected data from 56 simulations for postgraduate emergency medicine residents, 14 without a technologist (42 with one). After each session, the instructor and simulation technologist (if present) import data. Instructors rated the level of their cognitive load identical, regardless of whether technologists were present. Interestingly, instructors experienced reduced cognitive load related to the simulator and technical resources when technologists were present allowing the instructor to focus more on observing the learner(s) and modifying the simulation accordingly.

Sanaee with the University of Toronto in "Medical education reform: a catalyst for strengthening the health system", presents an important argument for medical educators and health system reformers. Sanaee tries to demonstrate that through a health systems framework, Competence by Design (CBD) provides a medium for health systems reform. Implications of effective implementation of CBD may include staffing shortages in academic hospitals, annual variation in medical education financing, new roles for clinician teachers, and greater demand for human health resource surveillance and patient outcome monitoring and analysis. These can be conceptualized as opportunities to improve coordination, harmonization, and system responsiveness.

"Supporting early academic family medicine careers with the clinician scholar enhanced-skills program" by Lacasse and her team describes the development and evaluation strategy of Laval University's Clinical Skills Program that trains clinician researchers/educators/leaders for academic family practice. They used Kern's model for program development and a program-oriented approach for program evaluation. Seven graduates and 14 non-graduates of the program participated in the evaluation. While the evaluation was quite positive, there were suggestions for improvement such as project-based learning with learner-centered objectives, relevant and authentic learning and assessment, and multi-level program evaluation approach.

In "Status of global health fellowship training in the United States and Canada", Evensen and her international team note the increasing numbers of residency graduates seeking global health (GH) fellowship training but lament the lack of clarity in training options. Using a web-based tool, they surveyed program directors or designates from 85 GH fellowships from which they garnered 50 responses. Most commonly, fellowships were 24 months in duration with a median size of one fellow per year. Funding and lack of qualified applicants were substantial challenges. Most programs were funded through fellow billing for patient care or other means of self-support. The number of U.S. and Canadian GH fellowship programs has nearly doubled between 2010 and 2017 but information about them is not readily available.

"Transitioning to competency-based medical education: impact of educational interventions on internal medicine residents' understanding of the purpose and process" by Daniels and team from the University of Alberta describe the measures they took to better inform residents of the purpose of and processes used in Competency by Design. They report on the use of short orientation videos and an overview of the learning objectives for each level of training.

"A student affairs podcast as novel communications tool" by Frayha and her team described the use of a podcast on topics relevant to the medical student experience. In just a short time, there have been over 20,000 downloads. Ninety-five percent of survey respondents indicated they would recommend this podcast to others. Given the mission of student affairs offices to advise, mentor, and educate students, this series of podcasts is an exciting innovation for all medical schools to consider.

"A resident-led clinic that promotes the health of refugee women through advocacy and partnership" by Stairs and her team from Dalhousie describes a longitudinal global health experiences to promote cultural competency and a commitment to caring for underserved populations. Obstetrics and gynecology residents have partnered with the Halifax Newcomer Health Clinic to provide education and medical care to refugee women. This resident-led initiative meets the care needs of an underserved population while promoting resident engagement in health advocacy.

Dr. Wilbur ask the question, "Should scholar be the new interprofessional competency?" With the almost universal use of evidence-based practices as a framework, understanding the evidence base for other professions is crucial. Hence, scholarship plays a crucial role in interprofessional shared decision-making.

In "A definition of coaching in medical education" Landreville and co-authors note that coaching differs from teaching and mentoring but lacks a clear operational definition. They suggest that coaching is a process that guides a learner towards performance improvement. This process is important since coaching is central to competence based medical education.

Finally, "Burnout" by Ranpara informs and entertains us with the stressed and rewarding life of the resident. Here are the first few lines:

> I run up and down the corridor
> Ticking tasks off my list
> Floor to floor
> Is there is anything I have missed…..

As I conclude this editorial, the final one of our 10th year of publication, I wonder what I too may have missed.

Canadian Medical Education Journal

Major Contributions

Does watching a movie improve empathy? A cluster randomized controlled trial

Est-ce que regarder un film améliore l'empathie? Un essai contrôlé randomisé par grappes

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Abstract

Background: We studied if watching a movie about the patient physician encounter alone or in combination with a communication skills training workshop could improve empathy score of medical students.

Methods: One hundred and thirty three medical students participated in one of the following four groups of the study. Group A: a three hour workshop (42 students); group B: watching the movie "The Doctor" (23 students); group C: watching the movie "The Doctor", then, participating in a three hour workshop the next day (22 students); group D: control group with no intervention (46 students). Participants completed Jefferson Scale of Empathy (JSE), Student Version to assess empathy score before and after the intervention, and one month later. A linear mixed effect model analyzed the effect of intervention across groups considering the effects of other significant variables.

Results: All of the three interventions had an immediate improving effect on empathy scores compared to control group. However, the improvement effect remained significant only in groups A (p=.015) and C (p=.001) one month later.

Conclusions: Watching selected movies has a significant but transient effect on empathy of students. Combining two methods of watching the movie and communication skills workshop, seems to add the beneficial effects.

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Résumé

Contexte: Nous avons étudié si le fait de regarder un film sur une rencontre patient-médecin seule ou en association avec un atelier de formation sur les compétences en communication pouvait améliorer le score d'empathie des étudiants en médecine.

Méthodes: Cent trente-trois étudiants en médecine ont participé à un des quatre groupes suivants de l'étude. Groupe A : un atelier de trois heures (42 étudiants); groupe B : regarder le film « Le Docteur» (23 étudiants); groupe C : regarder le film « Le médecin » et ensuite participer à un atelier de trois heures le jour suivant (22 étudiants); groupe D : groupe témoin sans intervention (46 étudiants). Les participants ont rempli l'échelle d'empathie de Jefferson (JSE), version étudiante, pour évaluer le score d'empathie avant et après l'intervention, ainsi qu'un mois plus tard. Un modèle d'effet mixte linéaire a analysé l'effet de l'intervention parmi les groupes en tenant compte des effets d'autres variables significatives.

Résultats: Les trois interventions ont un effet d'amélioration immédiate sur les scores d'empathie comparativement au groupe témoin. Toutefois, un mois plus tard, l'effet d'amélioration n'était resté significatif que dans les groupes A ($p = 0,015$) et C ($p = 0,001$).

Conclusions: Regarder des films sélectionnés a eu un effet significatif, mais transitoire sur l'empathie des étudiants. Combiner les deux méthodes, regarder le film et suivre un atelier sur les compétences en communication, semble ajouter les effets bénéfiques.

Introduction

"The surgeon's work is to cut…", said Dr. McKee to his students in an influential scene of the movie "The Doctor", trying to show how a surgeon should deal with emotions in an encounter with a patient.[1] Maybe many physicians still think as Dr. McKee and seek to keep emotions away for the sake of objectivity. However, this kind of attitude toward physician-patient relationship might adversely affect the quality of patient's care and undermine the formation of an empathic therapeutic relationship.

There has been a great deal of inconsistency in definition of empathy in the literature and important efforts have been done to review how empathy is defined in medical education research.[2] Hojat defines empathy as "a predominantly cognitive (as opposed to affective or emotional) attribute that involves *understanding* (as opposed to feeling) of the patient's experiences, concerns, and perspectives, and a capability to *communicate* this understanding and an intention to help".[3] Because of the beneficial effects of empathy in various outcomes of physician-patient encounter,[4] many studies have attempted to improve empathy in health professionals and students. This is especially important because many studies have reported that empathy score of medical students decreases with increasing years of education.[5] However, there are other studies that cast a doubt on the aforementioned decline of empathy[6] and even another study promise an improvement in some aspects of students' empathy with increasing years of education.[7]

Researchers have empirically validated at least ten methods for their positive effect on empathy. These methods include "improving interpersonal skills, audio- or video-taping of encounters with patients, exposure to role models, role playing (aging game), shadowing a patient (patient navigator), hospitalization experiences, studying literature and the arts, improving narrative skills, theatrical performances, and the Balint method".[8] Generally speaking, these enhancement methods try to either improve interpersonal skills of the participants or involve the trainees in an experience of disease and results in better understanding of the patients' problems, or both of them.

In other words, the methods used to improve empathy work on the ability of the participants to "understand" patients' experiences and emotions and their ability to "communicate" this understanding; the two main concepts that are included in the abovementioned definition of empathy. Role playing, shadowing a patient, hospitalization, theatrical performance, studying

literature and the art, and improving narrative skills mainly improve understanding of the participant from the real situations including pain and difficulties that patients experience and help the participant to view the issue from the patient's perspective. However, interpersonal skills workshops, audio or videotaping of interviews with patients, and Balint method might be more effective in improving communication ability and developing the necessary skills for better rapport. We are aware that this categorization might be an oversimplification and some of the aforementioned methods might affect both abilities simultaneously. However, we choose to label the methods in this way to emphasize the main concept underscored in each of them.

One of the weaknesses of these empathy enhancement methods is limited sustainability of positive changes: the finding of improved ability to empathize declines with time.[9] Reinforcing an educational method with another one can help to increase the beneficial effects or durability of the positive changes.[10,11] Watching films or movies has been successfully used both as a method to improve empathy[12,13] and a method combined with another educational method to improve sustainability of the increased empathy.[10] However, to our knowledge, no randomized controlled trial has yet been published on the effects of watching a movie on empathy and the possible effects of combining it with another augmenting method of empathy.

Therefore, we designed the study to see if watching a movie about the patient physician encounter (The Doctor, 1990)[1] alone or in combination with a communication skills training workshop could improve the empathy score of medical students. We hypothesized that the combination of the two methods might result in a greater improvement in empathy scores immediately after intervention and a smaller decline in empathy one month later.

Methods

Trial design and setting

Medical students who were taking clinical rotations in Rasoul-E-Akram Hospital during January 2016 to February 2017 comprised the study population. Rasoul-E-Akram Hospital is a big hospital complex in Tehran and one of the two main clinical training centers for medical sciences in Iran University of Medical Sciences (IUMS). Medical students take many of their rotations in this hospital.

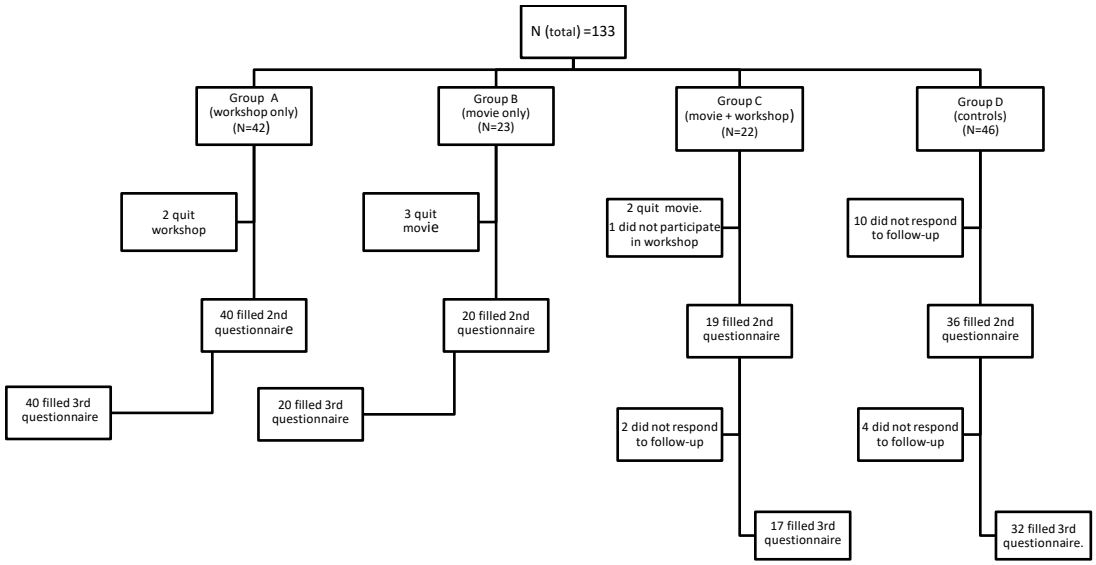
Participants

We included all of the wards of the hospital with a total number of 174 medical students in the study. These students were taking their clinical training period from year 4 to 7 of medical training. This clinical period is divided to an initial 2.5 year of externship period and a final 1.5 year of internship period. We used cluster random assignment method to allocate the wards to one of the four arms of the study. Ward administrative staff did not allow 41 students to leave their wards to take part in the study. Therefore, 133 students began the study in one of the following four groups.

- Forty two students in group A: A three hour workshop on communication skills training
- Twenty three students in group B: Watching the movie "The Doctor"
- Twenty two students in group C: Watching the movie "The Doctor", then, participating in a three hour workshop of communication skills training the next day
- Forty six students in group D: Control group with no specified intervention (Fig. 1)

It is important to note that the number of students taking rotations in different wards of the hospital was not equal. Furthermore, unexpectedly, a number of students were not allowed to participate in the study. Therefore, the number of participants were not equal in the four arms of the study. The number of students that completed the first phase of the study was 115 (18 students did not fill the second questionnaire) (more details in Fig. 1). Six students did not complete the one-month later follow up questionnaire and 109 students completed the study (82% retention rate).

Figure 1. Flow diagram of the trial showing 133 participants allocating to study arms and their progress through difference stages of the trial



Interventions

Communication Skills Training workshop: An associate professor of psychiatry with several years of experience in teaching communications skills (MNE) taught the workshop. The workshop began with a question about personal experience of the participants as a patient with doctors or health services, and about how this experience might have affected them. Then, he introduced the concept of patient-physician relationship, therapeutic relationship and empathy and its importance and discussed them with students. Finally, we showed a short role-play film depicting two different types of patient-physician interactions and discussed about the positive and negative points in each of the role-plays.

"The Doctor": It is an American movie directed by Randa Haines with a running time of 122 minutes (released in 1991). The story is about an arrogant cardiac surgeon (Dr Jack MacKee) who is diagnosed with laryngeal cancer and this new experience of illness provides him with fresh insight into patient-physician relationship. We showed the movie in the amphitheater of the hospital using a video-projector, in original language (English) with Persian subtitle. It is important to note that we performed the interventions (workshop and movie) of the different arms of the study independently and in different days but in the same amphitheater and with similar conditions.

Outcome measurement

Our main outcome measure was empathy of the students. We assessed the empathy score of the participants with Jefferson Scale of Empathy (JSE), Student Version at three time points. First, after allocation to the groups and before any intervention. Second, immediately after the intervention, or for the control group two to three hours after the first assessment. Third, one month after assignment to the groups.

JSE is a validated self-report scale that is specifically designed to assess empathy in health professionals and their related students.[3,14,15] It includes 20 items that are scored from 1 (strongly disagree) to 7 (strongly agree) in a Likert-type scale. The scale has been previously translated and validated in Persian.[16,17] Additionally, we added a number of demographic questions, including gender, age, marital status, and educational level (externship or internship) to the beginning of JSE.

Ethical issues

This study was approved by the Ethical Committee of Iran University of Medical Sciences (Code:IR.IUMS.REC 1395.9311286001). We were committed to the Declaration of Helsinki and ethical rules of our country throughout the study. We informed the participants that we would consider the data confidential and questionnaires are anonymous. Participation was voluntary and the participants were

able to withdraw without any consequences at any step of the study. Participants also received two gifts: one mug after first post-test and one flash-memory after 1-month follow-up test, at the end of the study. This study has also been registered as a clinical trial in Iranian Registry of Clinical Trials (Code: IRCT 2016082629534N1).

Statistical analysis

We used SPSS (Statistical Package for the Social Sciences) - version 16 for data analysis. We used Chi-square test to compare qualitative variables and analysis of variance (ANOVA) to compare quantitative variables between the groups. Due to the difference of the outcome variable at baseline, we calculated the differences of empathy scores observed in each group from baseline to second observation (intervention effect) and from second to third observation (stability of intervention effect) in order to observe the possible changes in empathy scores.

Considering the advantages of mixed effect models over traditional ANOVA models,[18,19] we decided to perform a linear mixed effect model analysis instead of a classical repeated measure ANOVA. We used repeated measure ANOVA only to have a general demonstration of the changes observed in each group. To measure the independent effect of the study intervention and potential covariates/factors on change in empathy score, we performed a linear mixed model analysis. We set the empathy score as the dependent variable and group, gender, educational level, passing psychiatric rotation, and time, as well as interactions of group*time, and group*gender as fixed effects and time as random effect and baseline empathy score as covariate in the primary model. To form the final model we excluded the variables that did not show a significant effect in the primary model (passing psychiatry rotation, educational level and group*gender interaction), and calculated parameter estimates of fixed effects and estimates of covariance parameters according to the final model. We calculated Cohen's d as an index of effect size of the intervention.[20] P value of <.05 was considered as statistically significant.

Results

The mean age of the participants was 24.7 (SD=1.5). Forty three (37.4%) participants were male and seventy two (62.6%) were female. Seventy-eight (67.8%) participants had taken the psychiatry rotation before the beginning of the study. Forty two (36.5%) participants were passing their externship training and 73 (63.5%) their internship training. There was a statistically significant baseline difference in age, educational level and passing psychiatry rotation between the four groups (Table 1).

Table 1. Baseline characteristics of 133 participants in the four arms of the trial

		Total	Group A	Group B	Group C	Group D	Statistical sig.
Age (years)	Mean(±SD)	24.7(±1.5)	24.7(±1.4)	24.0(±1.4)	24.3(±1.2)	25.4(±1.4)	≤ 0.001
Gender N (%)	Male	43(37.4%)	13(32.5%)	5 (25.0%)	8 (42.1%)	17(47.2%)	0.336
	Female	72(62.6%)	27(67.5%)	15(75.0%)	11(57.9%)	19(52.8%)	
Passing psychiatry rotation N (%)	Yes	78(67.8%)	25(62.5%)	10(50.0%)	11(57.9%)	32(88.9%)	0.009
	No	37(32.2%)	15(37.5%)	10(50.0%)	8 (42.1%)	4 (11.1%)	
Educational Level N (%)	Externship	42(36.5%)	17(42.5%)	10(50.0%)	12(63.2%)	3 (8.3%)	≤ 0.001
	Internship	73(63.5%)	23(57.5%)	10(50.0%)	7 (36.8%)	33(91.7%)	
Marital status N (%)	Single	91(79.1%)	28(70.0%)	19(95.0%)	15(78.9%)	29(80.6%)	0.164
	Married	24(20.9%)	12(30.0%)	1 (5.0%)	4 (21.1%)	7 (19.4%)	

Empathy score

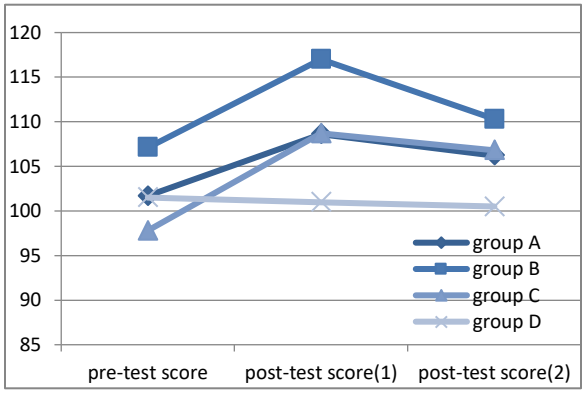
The mean empathy score (based on JSE) for all of the participants before interventions were 101.9 (SD=12.2) and there was no significant baseline empathy score differences between the four groups, but immediately after interventions, the mean increased to 107.7 (SD=12.3), and this intervention effect was different between groups (Figure 2). All of the active intervention groups showed an increase in JSE score, but group D (control group) did not show a

significant change. The increase was more prominent in groups B and C. However, at 1-month follow up, JSE score decreased to 105.4 (SD=10.9). This decline was again observed in all three active intervention groups and was more pronounced in group B (film only). Decline of JSE score was not present in the control, group D (Table 2) (Fig.2).

Table 2. Mean score of JSE before (baseline score) and after intervention (post-test 1) and one month later (post-test 2) and its statistical significance based on repeated measure ANOVA in 133 participants of the four arms of the trial

	Baseline score	Post-test 1	Post-test 2	Statistical sig.
	Mean (SD)	Mean (SD)	Mean (SD)	
Group A	101.7 (10.8)	108.6 (10.9)	106.2 (10.3)	P=0.004
Group B	107.1 (9.4)	117 (11.2)	110.3 (9.8)	P=0.104
Group C	97.8 (14.6)	108.7 (8.7)	106.8 (7.8)	P=0.006
Group D	101.5 (13.1)	101 (12.6)	100.5 (12.4)	P=0.8
Total	101.9 (12.2)	107.7 (12.30)	105.4 (10.9)	

Figure 2- Changes observed in JSE score at three time points before and after the intervention and one month later on 133 medical students.



We used linear mixed effect model analysis to the measure independent effect of study intervention and potential covariates/factors. The primary model included empathy score as dependent variable and group, gender, educational level, passing psychiatric rotation, and time, as well as interactions of group*time, and group*gender as fixed effects and time as random effect and baseline empathy score as covariate in the primary model. Passing psychiatry rotation, educational level and group*gender interaction did not show a significant effect and were excluded from the final model as suggested by Seltman (chapter 15, p. 369).[19]

In the final model, the following variables showed a significant effect: group (p<.001), time (p<.001), gender (p=.02), baseline empathy score (p<.001) and group*time interaction (p<.001). It shows that each of these variables independently are related with empathy score. However, to understand the difference between the groups and across time, we need to look at parameter estimates of fixed effects (Table 3). In this table, group D, third assessment, has been considered as the index group for comparison in the model and their value have been set to zero.

Table 3. Parameter estimates of fixed effects of the variables and interactions in the mixed effect model analysis on a sample of 133 medical students

Parameter	Estimate	t	Sig.
Intercept	22.3	6.1	<.001
Group A	4.8	3.1	**.002**
Group B	4.6	2.4	**.016**
Group C	8	4	**<.001**
Group D	0[a]	.	.
Pretest	.5	.4	.71
Post-test 1	.1	.1	.93
Post-test 2	0[a]	.	.
Group A * Pretest	-5.1	-2.5	**.015**
Group A * Post-test 1	2.3	1.1	.27
Group A * Post-test 2	0[a]	.	.
Group B * Pretest	-3.7	-1.5	.13
Group B * Post-test 1	6.6	2.6	**.009**
Group B * Post-test 2	0[a]	.	.
Group C * Pretest	-9	-3.5	**.001**
Group C * Post-test 1	2.3	.9	.37
Group C * Post-test 2	0[a]	.	.
Group D * Pretest	0[a]	.	.
Group D * Post-test 1	0[a]	.	.
Group D * Post-test 2	0[a]	.	.
Female	1.9	2.3	**.022**
Male	0[a]	.	.
Pretest score of empathy	.8	22.3	**<.001**

a. This parameter is set to zero because it is redundant.

Mean score of empathy was different between group D and all of the other groups regardless of time of assessment (first four rows of Table 3). Time variable is shown not to be associated with empathy score (next three rows of table 3). The main finding of this table is the significant interaction of group and time on empathy score. It means that empathy score has changed differently during time in different groups.

Interaction of time and groups A and C shows that empathy score in post-test 2 is significantly higher than pretest (group A: p=0.015, group C: p=0.001), but not significantly different from post-test 1 (group A: p=0.27, group C: p=0.37). It means that in Group A and C, empathy has significantly changed from first to second assessment, but there is no significant change from the second to the third assessment. In other words, empathy improved in "workshop only" group (group A) and film and workshop group (group C) and did not significantly decline one month later. However, in group B the score of empathy in post-test 2 is significantly lower than post-test 1 (p=0.009), but not different from pretest score (p=0.13). It means that empathy has increased in group B from the first to second assessment and has again declined one month later. The final rows of Table 3 show the significant independent effect of gender and pretest score of empathy on dependent variable.

Finally, estimates of covariance parameters was not significant in the model (Wald Z=1.9, p=.052). Therefore, the model did not support the presence of a random effect for the variation of empathy score in each participant across different assessments. In other words, the findings does not confirm the presence of an unmeasured explanatory variable that might change the performance of each participant in a seemingly random way in different assessments.

Effect size

We measured Cohen's d index for groups A and C that showed a significant improvement of empathy after one month (table 4). We calculated effect size using the first and third assessments [Cohen's d = (M3-M1)/pooled SD]. Group A had a small to moderate effect size (.43) but group C showed a medium to large effect size (.77).

Table 4. Intervention effect and stability of intervention and the calculated effect size of the intervention in 133 participants of the four arms of the trial

	Intervention effect	Stability of intervention	Net effect	Cohen's d
	Mean (SD)	Mean (SD)		
Group A	6.9 (8.2)	-2.4 (8.7)	4.5	.43
Group B	9.9 (8.6)	-6.7 (8.7)	3.2	-
Group C	10.9 (12)	-2.6 (4.9)	8.3	.77
Group D	-.4 (6.8)	-.2 (10)	-.2	-
Total	5.8 (9.6)	-2.6 (8.8)	3.2	

Intervention effect: change in JSE score observed between baseline and second assessment immediately after intervention; Stability of intervention: change of JSE score from second to third assessment showing the decline after one month of follow up.

Discussion

The study shows that all of the three interventions (communication skills workshop, watching the movie, and workshop plus watching the movie) have an immediate positive effect on empathy scores of medical students compared to control group. However, watching the movie seemed to increase the immediate effect and participating in the workshop tended to decrease the decline of the score during the follow up and so appeared to improve the sustainability of the effect of the intervention.

In this study we tried to evaluate the effect of augmenting the most widely studied method of empathy improvement i.e., communication skills training with watching a movie. We expected that watching the movie would increase the motivation of the participant to learn from the workshop and in this way would increase the beneficial effect of education on empathy. However, the study findings did not support this hypothesis, at least for its short-term effects that we assessed immediately after the intervention. Combination of the two methods (workshop and movie) showed a larger effect size compared to the "workshop only" group, but the difference was not statistically significant. Interestingly, the two groups who watched the movie had a steeper immediate increase in their empathy scores. Therefore, it seems that short-term effects of watching the movie might even be more powerful than participating in the workshop; but the two effects are not additive at this time point.

Why this happens might be due to different mechanisms by which the two methods affect empathy. Movies engage participants emotionally with the story and make them identify with characters. This emotional involvement and identification with movie characters might be the underlying mechanism through which empathy is enhanced. Because it prepares an opportunity for the participants to share the experience of the movie character and get familiar with his problems to some extent. This involvement helps the participants to improve their "understanding" of the patient's experience. Gladstein put forward this concept as "[v]iewers lose themselves in the film to the extent that they are not conscious of their surroundings. These ideas closely parallel Lipps's beliefs about empathy".[21]

On the other hand, a communication skills workshop defines the related concepts and helps the participants learn the definition and implications of empathy and its positive effects on treatment outcomes and how it can be used in encounters with patients. Several studies have shown the effectiveness of these workshops in improving empathy of the participants.[22,23] These workshops generally employ a variety of techniques, including lecture, audio or visual presentation of educational material, and role playing to teach basic communication skills (recognition patient's emotions and communicating them in a constructive way) to the intended audience.[8,22] Therefore, workshop provides more explicit and structured learning about the physician-patient relationship than the movie. It seems that the "movie only" group have experienced a kind of arousal and increased attention to the subject area of the movie, which is patient-physician relationship and so, have an increased score in JSE. However, the lack of formal teaching in the "movie only" group did not allow the students to benefit from their increased attention and learn a new skill. This assumption might explain why the "workshop only" group had a better sustainability and a smaller decline in empathy one month later compared to the "movie only" group.

Finally, when we augment structured learning provided by the workshop with watching the movie, we may profit from the merits of both methods, i.e., emotional involvement that results in a steeper increase in empathy, and structured learning that results in a slower decline of empathy. Therefore, the net effect of combining workshop and movie would be a larger effect on empathy and a larger mean difference compared to workshop. Combination of instructional and experiential methods has also been used by Bayne to improve empathy in medical students.[24] Interestingly, the effect size of this study has been reported to be larger than the other studies reviewed in a systematic review (mean effect size of 15 articles=.23).[25] Combination of strategies has also been used as an augmentation method to boost and increase the sustainability of previous education. For example, Hojat et al. showed that augmenting a first intervention to improve empathy (watching and discussing video clips about patient encounters) with an upcoming lecture on empathy would increase the sustainability of the intervention effect on empathy score of medical students.[10]

These findings suggest that combining various educational methods could have beneficial effects and remove some of the shortcomings of the current known methods. Herein, workshops have an exceptional potential for combining different methods. As mentioned above, many different presentation methods, other than lecture, including audio or visual presentation of educational material, role-playing, and theatrical performance have been integrated into communication skills workshops to enrich them and augment their positive effects on empathy.

Our study has some strengths and limitations. Design of the study with three intervention and one control group made it possible to examine reliably the effect of watching the movie in isolation or in combination with communication skills training workshop. Furthermore, using a well validated scale and powerful statistical methods are other strengths of the study.

However, we only conducted the study in one center, which limits the generalizability of the findings. Furthermore, study groups were different in the level of education and empathy score at baseline. Level of education was not independently associated with empathy score; therefore, we do not think that the difference in level of education would have caused a noticeable problem. Moreover, we included the baseline scores of JSE as a covariate in the model and controlled for its possible effect. The other limitation of our study is the fact that we did not randomly allocate each participant to the study groups. Instead, we randomly assigned the study clusters. This is an acceptable alternative method when individual allocation of the participants is not possible. Finally, the movie was shown in English with Persian subtitles; presentation of a Persian translated version of the movie might have been more effective.

Conclusion

Showing movies depicting patient-physician encounters and related issues to medical students seems to have beneficial effects on learning of empathy, when combined with communication skills workshops. We suggest that medical schools consider using this method; because it is not only a socializing

and enjoyable activity, but also an inexpensive method that can be easily administered. Future studies can make use of other creative ways to increase the effect size or sustainability of the changes or develop practical programs that can be integrated into curriculum of medical education.[26]

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Canadian Medical Education Journal

Major Contributions

Medical Assistance in Dying: the opinions of medical trainees in Newfoundland and Labrador. A cross-sectional study

Aide médicale à mourir : les opinions des apprenants en médecine de Terre-Neuve-et-Labrador. Une étude transversale.

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Abstract

Background: Medical Assistance in Dying (MAiD) was legalized in Canada in 2016. As future physicians, medical trainees may face decisions regarding MAiD. Although many publications exist internationally, Canadian data is limited in the peer-reviewed literature, particularly following legalization. The purpose of this study is to determine the opinions of medical trainees in Newfoundland and Labrador regarding MAiD, and the factors that impact these views.

Methods: A survey was distributed to all under- and postgraduate medical trainees at Memorial University (N=570), the only medical school in Newfoundland and Labrador. The survey collected demographic information and opinions regarding MAiD. Respondents were divided into groups based on demographic characteristics, and their responses analyzed using non-parametric statistics.

Results: The survey was completed by 124 trainees. Ninety percent of respondents agreed with the legalization of MAiD in Canada and nearly 60% stated they would perform the procedure for their patients. Several factors influenced the opinions of medical trainees, including level of training and religious affiliation. Trainees also favored detachment from the MAiD process.

Interpretation: Medical trainees in Newfoundland and Labrador are largely in favor of MAiD. This may highlight the importance of emphasizing MAiD within medical curricula, so that trainees are adequately informed and prepared for this new aspect of medical care upon joining independent practice.

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Résumé

Contexte: L'aide médicale à mourir a été légalisée au Canada en 2016. En tant que futurs médecins, les apprenants en médecine devront peut-être prendre des décisions concernant l'aide médicale à mourir. Bien qu'il existe plusieurs publications au niveau international, les données canadiennes sous forme d'articles évalués par des pairs sont limitées. Cette étude vise à connaître les opinions des apprenants en médecine de Terre-Neuve-et-Labrador concernant l'aide médicale à mourir, et déterminer les facteurs qui influencent leurs points de vue.

Méthodes: Un sondage a été distribué à tous les étudiants en médecine et résidents de l'Université Memorial (N=570), la seule faculté de médecine à Terre-Neuve-et-Labrador. Ce sondage a recueilli des informations démographiques et des opinions concernant l'aide médicale à mourir. Les personnes interrogées ont été divisées en groupes établis selon des caractéristiques démographiques, et leurs réponses ont été analysées à l'aide de statistiques non paramétriques.

Résultats: 124 apprenants ont complété le sondage. 90 pour cent des personnes interrogées étaient en faveur de la légalisation de l'aide médicale à mourir au Canada et près de 60 % ont indiqué leur intention d'effectuer cette intervention auprès de leurs patients. Plusieurs facteurs ont influencé les opinions des stagiaires en médecine, notamment le niveau de formation et l'affiliation religieuse. Les stagiaires ont également favorisé le détachement face au processus d'aide médicale à mourir.

Interprétation: Les apprenants en médecine de Terre-Neuve-et-Labrador sont très favorables à l'aide médicale à mourir. Ces résultats font ressortir l'importance d'intégrer l'aide médicale à mourir aux programmes d'études en médecine pour bien informer et préparer les stagiaires à cette nouvelle dimension des soins médicaux avant de débuter leur pratique.

Introduction

Physician-assisted death has been a common topic in the medical community for decades.[1] Internationally, legislation exists in a few countries allowing patients who meet specific inclusion criteria to end their lives through medical means. In Canada, the prohibition on physician-assisted dying was unanimously struck down in the Supreme Court of Canada (SCC) on February 6, 2015.[2] As of June 17, 2016, amendments to the Criminal Code of Canada and other related Acts were completed and Medical Assistance in Dying (MAiD) was legalized in this country.[3]

Several studies have reported the opinions of medical trainees towards MAiD, some including those of Canadian trainees.[4,5] However, the data for these Canadian studies were collected before the official legalization of MAiD. Despite this, Bator et al demonstrated strong support for MAiD among Canadian medical students, who felt that patient autonomy was the key ethical principle driving their view.[4] The authors also found that religious ties reduced support for MAiD, and that students were less likely to support MAiD for patients with mental illnesses.[4] This cohort expressed a need for additional training in MAiD, specifically around medical-legal issues, communication skills and technical aspects of the MAiD process.[4] Spicer et al assessed the opinions of residents regarding MAiD and concluded that while most residents would be willing to provide MAiD for eligible patients, they felt that more formal training around MAiD and palliative care was required prior to doing so.[5]

From an international perspective, several studies suggest that religiosity[6-11] and female gender[6-8] are associated with reduced support for MAiD. Progression through medical training also influences perspectives, with senior students more apprehensive about providing lethal prescriptions than their juniors.[12] Similarly, attending physicians are less accepting than trainees.[1,7,13-15] Other factors that may affect the opinions of trainees include legality[9] and exposure to palliative care training.[6,13]

The extent to which trainees wish to be involved in MAiD is also described in the literature. This refers to their willingness to administer a lethal drug, provide a prescription for self-administration or refer to another healthcare provider for MAiD. Overall, trainees often favor self-administration by the patient over injecting the medication themselves.[4,15-17] In the medical community, assisted death may be viewed by

some as contradictory to the "professional ethos"[15] of a physician, misaligned with the typical goals of sustaining life.[15-16] Other reasons favoring detachment from the process include the potential for creating a "slippery slope",[15] along with medical-legal concerns among physicians.[17]

In Newfoundland and Labrador, the site of our study, the current framework for MAiD deems the process acceptable for patients 18 years of age and older who (1) have an irremediable medical condition that (2) causes enduring and intolerable suffering and (3) whose death is reasonably foreseeable.[18] The patient must demonstrate capacity and decide to proceed without coercion. The process requires involvement of two eligible healthcare providers (physicians or nurse practitioners) who each must independently determine that the patient is an appropriate candidate for MAiD. While trainees may be involved in the process for learning purposes, they are not permitted to act as an independent assessor.

Medical trainees may face decisions regarding MAiD throughout their careers and their opinions towards this practice are relevant when shaping the regulatory framework that will govern it. Since MAiD was legalized in Canada, the opinions of medical trainees are largely absent in the peer-reviewed literature. Therefore, the purpose of our study is to gauge the opinions of medical trainees regarding MAiD in Newfoundland and Labrador, and to propose some potential demographic factors that may influence these views. Since the Canadian literature suggests that a gap exists regarding MAiD training,[4,5] we will also explore connections between our findings and the potential role for additional education.

Methods

We developed a survey tool (Appendix A) collecting demographic information, as well as responses to several statements pertaining to MAiD using a five-point Likert scale ranging from *strongly disagree* to *strongly agree*. Our objective was to explore the opinions of trainees at Memorial University based on the relevant findings in the literature.

Following approval from the Newfoundland and Labrador Health Research Ethics Board, we distributed surveys via university e-mail to all students and residents enrolled in the undergraduate MD and postgraduate degree programs. Participants received e-mail reminders approximately one week following survey distribution. Participation in the study was voluntary and completion of the survey represented implied consent. All responses were anonymous.

To obtain an overall impression of the attitudes of participants regarding MAiD, we used frequency counts to analyze the dataset. Although we collected specific information regarding many demographic factors, we often combined participants into broader categories to preserve their anonymity. We performed non-parametric statistical analysis (Mann-Whitney U test and Kruskal-Wallis ANOVA) using SPSS software (version 24.0) to assess between-group differences. A p-value of less than 0.05 denoted statistical significance.

Results

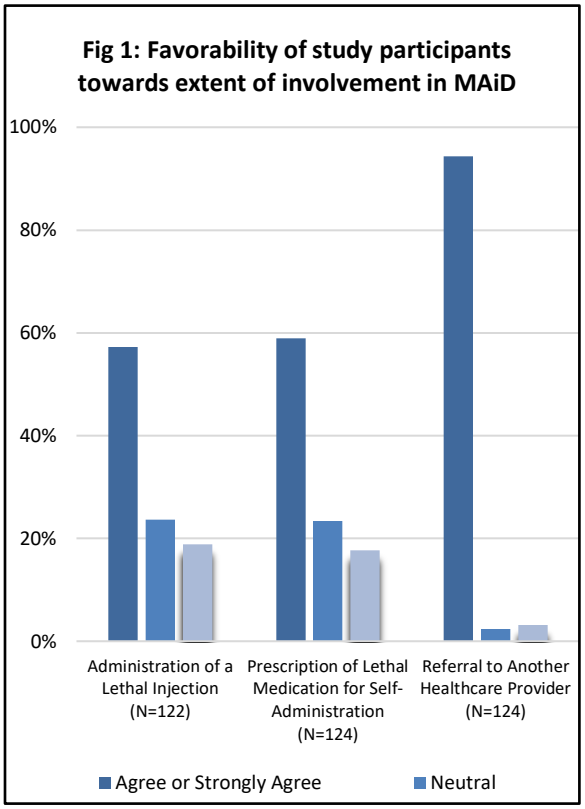
We distributed the survey to approximately 570 medical trainees at Memorial University. 124 trainees completed it, yielding an overall response rate of 22%. The specific response rates were 24.7% among students and 18% among residents. Table 1 outlines respondent demographics. Overall, the population of respondents was comprised of 63.7% students and 36.3% residents, with most medical students in the first two years of the four-year undergraduate program. Among the resident cohort, approximately half were in the first two years of their training.

Table 1: Demographics of study participants (N=124)

Level of Training	Students	63.7%
	Residents	36.3%
Gender	Male	33.1%
	Female	66.9%
Age	20-29	75.8%
	30+	24.2%
Religion	Identified Religious Affiliation	45.5%
	No Religious Affiliation	54.5%
Province of Origin	Atlantic Canada	75.0%
	Other Canada	21.8%

	International	3.2%
Population of Hometown*	Small (1-29,999)	43.5%
	Medium (39,999 – 99,999)	10.5%
	Large (100,000+)	46.0%
Undergraduate Degree	Bachelor of Science	76.4%
	Healthcare	9.8%
	Other	13.8%

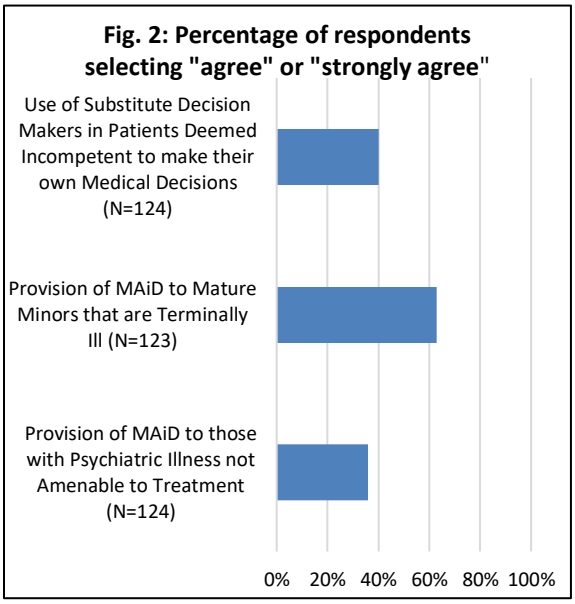
Participants largely supported MAiD legalization, with 89.5% of respondents selecting "agree" or "strongly agree". Trainees more frequently favored referral for MAiD rather than direct involvement:, 57.3% agreeing to administer a lethal drug, 58.9% agreeing to prescribe a drug for self-administration and 94.4% supporting referral to another provider. (Fig. 1)



When asked about the likelihood that they would personally choose MAiD if they were diagnosed with a terminal illness, less than half of respondents agreed (47.6%), with an additional 43.5% selecting "neutral". Interestingly, even among the subgroup of trainees that favored legalization, only 51.3% agreed that they would personally pursue MAiD if they were terminally ill.

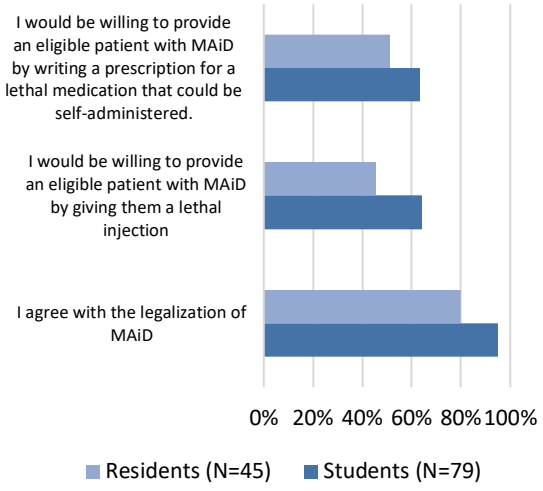
Our survey also aimed to address some of the more contentious issues surrounding MAiD, including the use of Substitute Decision Makers (SDMs) and provision to the mentally ill and mature minors. The percentage of participants expressing support for MAiD in these circumstances is illustrated in Figure 2. Much of the cohort (63.4%) supported the provision of MAiD to mature minors, however, fewer than half of them supported MAiD for the mentally ill or the use of SDMs.

We also divided participants into groups based on demographic parameters, yielding several noteworthy between-group differences. When categorized based on level of training, students versus residents, the difference in mean-rank values of several survey questions were statistically



significant ($p<0.05$). Students (94.9%) were more likely to agree with MAiD legalization than residents (80.0%). Furthermore, students were also more likely to agree with both administration of medication and the writing of lethal prescriptions. (Fig. 3). No significant differences in mean-rank values were observed among other survey questions.

Fig. 3: Differences in opinion between students and residents regarding MAiD



Participants were also grouped based on religious affiliation, with 56 participants declaring religious ties and 67 having no religious affiliation. Higher mean rank scores were observed in the religiously unaffiliated group across all questions regarding MAiD. For instance, 97.0% of participants with no religious affiliation agreed with MAiD legalization, compared to 82.4% of those affiliated with a religious faith. Additionally, participants without religious attachments were more agreeable to each form of provision explored, as well as the use of SDMs. They were also more likely to support MAiD for the mentally ill and mature minors, and to express a personal interest in MAiD if they were terminally ill.

Several other factors were considered, including age, gender, undergraduate degree and population of a participant's city or town of origin. No statistically significant differences were observed between groups based on these parameters for any of the survey questions.

Discussion

Overall, medical trainees at Memorial University are largely supportive of MAiD, with nearly 90% of respondents agreeing with its legalization. Regarding extent of involvement, trainees prefer an indirect role in the process, with most agreeing to refer patients to another healthcare provider for MAiD. More direct approaches, such as the administration of a lethal medication or prescribing one for self-administration were less favorable, which is consistent with other published literature.[15-17] This is perhaps not surprising, as the concept of MAiD elicits a conflict between two fundamental ethical principles in medicine – autonomy and non-maleficence. Considering life as valuable is fundamental to the culture of medicine,[15] and directly participating in a patient's death can be considered a violation of moral beliefs.[17] Interestingly, 5.6% of our population did not agree with referral to another provider, which may call their knowledge of the current regulatory framework into question, as conscientious objectors currently must refer eligible patients to another provider. This may highlight a need for further education around the local regulatory framework governing MAiD. Alternatively, these participants may disagree with the current framework, and thus be willing to refuse referring their patients regardless of the consequences.

Although trainees agree with legalization of MAiD, there is hesitancy to support contentious topics, such as the provision of MAiD to patients with psychiatric illnesses. Trainees elsewhere are also reluctant to support MAiD for patients experiencing psychological suffering.[4,7] Moreover, staff physicians have also been apprehensive towards MAiD for patients experiencing mental illness.[19] We postulate that this may reflect concerns about a patient's capacity to consent, given that a comorbid mental illness can pose challenges regarding capacity assessment. A further consideration among our population is that our survey simply states, 'psychiatric illness that is refractory to treatment'. This leaves room for interpretation from the respondent, who may be more willing to accept or deny MAiD depending on the disease and the degree of suffering that it is causing. Finally, this may reflect a frequently discussed stigma around mental illness that exists in society today. When considering the use of SDMs, our study population was also unsupportive. Concerns have been expressed previously about the potential for creating a "slippery slope" with MAiD legalization.[15] A similar concept may be at play here, as designating SDMs introduces the potential for patient coercion and compromising patient autonomy. The ethical principle of autonomy was a key factor for Canadian medical students to support MAiD,[4] which may corroborate this hypothesis.

Finally, study participants were largely in favor of MAiD provision for mature minors, which again may highlight trainees' respect for patient autonomy. We anticipate that mature minors would be supported with caution, perhaps in the setting of terminal illness where the patient was deemed competent to make independent medical decisions. It has been suggested that legality may also influence one's views of MAiD,[9] however, our results are not consistent with this. Among the three contentious issues explored, the provision of MAiD for patients with psychiatric illness received the least support, yet is the only issue that is not explicitly prohibited within the current regulatory framework.[18]

Among the study population, one's level of training impacted their opinion of MAiD, with medical students more frequently supporting direct approaches. Similar views were expressed by medical students at another Canadian university.[4] This illustrates that agreement with MAiD may decrease as we ascend the medical hierarchy, as demonstrated by similar studies.[1,7,12-15,20] While these views may reflect a different moral stance among physicians and residents, some have proposed that these differences exist due to the longstanding relationships that physicians have with their patients along with generational differences that exist between groups.[15] Our study results, however, did not demonstrate statistically significant differences in opinion based on the age of participants. Since legalization of MAiD is a recent development in Canada, senior residents are also less likely to have received formal education in the practice.[5] As such, they may feel less comfortable offering it, which may explain the lower agreeability that we observed among this group. In another Canadian study, only 35% of residents felt as though their programs provided adequate training to make informed decisions about MAiD.[5] This may support a need for further MAiD training within undergraduate and postgraduate medical curricula.

Having an identified religious affiliation may also impact a trainee's attitude towards MAiD. In this study, participants with a religious affiliation were less likely to agree with all elements of MAiD addressed in the questionnaire, a finding that has been replicated elsewhere.[4,6-9] Among the religiously affiliated, 79% were of the Christian faith. Therefore, our result may have been biased by a predominance of this belief system, as other literature has demonstrated reduced support for MAiD among Catholics.[6] Among the subgroup of participants who identified as Christian in our study, only 22% agreed that their religion had a large impact on their everyday lives, and among this smaller subgroup, 70% still expressed support for MAiD legalization. In Newfoundland and Labrador, where the current rate of MAiD provision is below the national average, several faith-based healthcare facilities have expressed opposition toward the practice.[21] Therefore, this difference may also be explained by the predominant views of local religious groups as opposed to those of a specific faith.

There are some limitations to our study. With a small sample size, the impact of several demographic factors, such as specific religious affiliations, type of undergraduate degree and postgraduate training program could not be addressed. Additionally, the presence of responder bias and the inclusion of participants at one medical school in one Canadian province may limit the generalizability of our results to other Canadian trainees. Finally, given that trainees currently are not permitted to be directly involved in MAiD, their responses to survey questions are hypothetical. Therefore, it is possible that, if participants were permitted to offer MAiD to patients, their opinions would change.

In conclusion, our results demonstrate that medical trainees in Newfoundland and Labrador are largely supportive of MAiD, however favour more strongly a detached role from the process. While religious affiliation and level of training may influence opinions regarding MAiD, our results also demonstrate a potential need for additional training at the undergraduate and postgraduate levels, which is consistent with other Canadian studies on the topic.[4,5] MAiD remains a new concept in Canada and should continue to evolve both practically and theoretically. By understanding the factors that influence the opinions of future physicians, we may play a role in informing the practice of MAiD in our country.

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Canadian Medical Education Journal

Major Contributions

"Disadvantaged patient populations": A theory-informed education needs assessment in an urban teaching hospital

« Populations de patients défavorisés » : une évaluation des besoins en éducation éclairée par la théorie dans un hôpital d'enseignement urbain

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Abstract

Background: Recent calls in medical education and health care emphasize equitable care for disadvantaged patient populations (DPP), with education highlighted as a key mechanism toward this goal. As a first step in understanding potential education needs we wanted to better understand the DPP concept.

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Methods: Framed as a critical needs assessment, we used a critical discourse analysis approach to explore the meanings and effects of DPP. We analyzed transcripts from 15 focus groups with trainees, staff and patients.

Results: We identified three main assumptions about DPP: 1) disadvantaged patients require care above what is normal; 2) the system is to blame for failures in serving disadvantaged patients; and 3) labeling patients is problematic and stigmatizing. Patients appreciated that the DPP concept opened up better access to care, but also felt 'othered' by the concept. As a result, patients felt they were not accessing the same level of care in terms of compassion and respect.

Conclusion: We must define access beyond ability to receive services; access must also engender a sense of common humanity and respect. With this aim, we suggest three, theory-informed educational approaches to help improve care for DPP: 1) sharing authentic and varied stories; 2) fostering dialogue; 3) aligning assessment and educational approaches.

Résumé

Contexte : Des préoccupations récentes en éducation médicale et ensanté mettent l'accent sur les soins équitables dispensés auprès des Patients issus de Populations Défavorisés (PPD). Dans ce contexte, l'éducation est mise de l'avant comme un mécanisme clé dans l'atteinte de cet objectif. Comme première étape dans la compréhension des besoins potentiels en éducation, nous voulions mieux comprendre ce que recouvre le concept de PPD.

Méthodes : Présentée comme une évaluation critique des besoins, nous avons utilisé une approche d'analyse du discours critique pour explorer les significations et les effets des PPD. Nous avons analysé les transcriptions de quinze groupes de discussion avec des stagiaires, du personnel et des patients.

Résultats : Nous avons repéré trois suppositions principales au sujet des PPD : 1) les patients défavorisés nécessitent davantage de soins que la normale; 2) le système est à l'origine des défaillances à servir les patients défavorisés; et 3) l'étiquetage des patients est problématique et stigmatisant. Les patients ont aimé que le concept des PPD procure un meilleur accès aux soins, mais ils se sont sentis également « exclus » par les paramètres du concept. En conséquence, les patients estimaient qu'ils ne recevaient pas le même niveau de soins en matière de compassion et de respect.

Conclusions : Nous devons définir l'accès au-delà de la capacité de recevoir des services; l'accès doit également engendrer un sens d'humanité commune et de respect. Dans ce but, nous suggérons trois démarches pédagogiques éclairées par la théorie pour aider à améliorer les soins aux PPD : 1) partager des histoires authentiques et variées; 2) promouvoir le dialogue; 3) aligner les démarches d'évaluation et d'enseignement.

Introduction

Recent calls in medical education and health care have emphasized equitable care for patients experiencing disadvantage.[1,2] Disadvantaged patient groups (individually and collectively) are increasingly considered in the development of hospital strategic plans and the social determinants of health (SDoH) are now common content in medical school curricula.[3–5] SDoH are defined by the World Health Organization as the conditions in which people are born, grow, work, and live, and the broader set of systems that shape the conditions of daily life.[6] At an individual level, SDoH such as housing, employment status, and working conditions impact people's daily lives, determining their risk of illness and ability to access preventive and curative health care measures.[6] At a societal level, inequities between groups of people shape how society is organized, often into hierarchies based on factors such as income, gender, and race.[7] Where people sit in a social hierarchy ultimately affects their health and wellbeing in general.

In 2015, our hospital's corporate strategic plan prioritized caring for disadvantaged patient populations – patients who are relegated to lower social status within the prevailing hierarchical structure of our societies. Our team was called upon to help develop a hospital-wide education approach to support the strategic priority of "transforming systems of care to ensure improvement in equitable access for all patients." Underpinning our approach

was a transformative paradigm of education. By paradigm of education, we are referring to different ways of conceptualizing the purpose and goals of education. Dominant cognitivist and behaviorist paradigms focus on changing behavior and teaching memorization and application of content knowledge, whereas a transformative paradigm focuses on shifting ways of seeing and inspiring social action. Therefore a transformative paradigm aligns with the ultimate goal of transforming systems.[8]

A necessary first step in designing any education initiative, is conducting a needs assessment. Given the identified need to attend to power when working toward equity in health,[9] we used the critical conception of discourse as the theoretical frame for our needs assessment. By discourse we are referring to a language-based system of meaning, situated in an historical and cultural context. This system of meaning governs what we believe, and how we act. If we aim to transform systems, we first need to understand the discourses in our current system and what they are enabling or constraining.[10,11] With a critical lens, discourses construct and give power to specific institutions, create roles for individuals to play in the system and make possible the existence of certain objects (material and conceptual). Without critical approaches to help examine discourses and how they influence what we believe and how we act, we risk merely perpetuating the status quo.[10,12,13]

Thus, we examined *disadvantaged patient populations* (DPP) as a dominant discourse in our organization with an eye to education needs and opportunities. We asked: How do people in our hospital community speak about DPP and what does this tell us about education needs and opportunities in relation to caring for DPP? By looking critically at the discourse of DPP, we can begin to understand the ways in which the dominant conception might limit actual change and identify meaningful ways forward through education.

Methods

We conducted a critical needs assessment to explore the effects of DPP as a dominant discourse and what that tells us about education needs in our hospital. We do not presume that education will solve all the problems related to DPP, but we are interested in uncovering what educational needs may exist and be amenable to educational intervention. This study was approved by the St. Michaels' Hospital (SMH) ethics committee.

Setting

We situated our study within SMH , a hospital in the downtown core of Toronto Ontario, one of the world's most ethnically diverse cities.[14] Its geographic location and historical commitment to compassionate care for the disadvantaged led SMH to serve a diverse patient population. According to the 2015 Strategic Plan, "We care for people with severe and persistent mental illnesses and substance abuse issues, refugees, immigrants, vulnerable seniors, people with disabilities, and those challenged by other social determinants of health. We provide the homeless with a warm, safe place to recover after treatment in the Emergency Department."

Participants

A total of 70 participants agreed to participate in our needs assessment.

We recruited staff representing health disciplines, nursing, medicine, and other hospital staff through organizational gatekeepers (administrators of various departments) and trainees through the hospital's student centre. All care providers (staff and trainees) learning and working at SMH were eligible to participate.

We recruited patients from the categories of disadvantage as named in the SMH strategic plan through partnerships with community organizations. These categories included: people experiencing mental health and addiction challenges, people who are homeless and underhoused, Indigenous peoples, new immigrants or refugees, and people across all sexual orientations, and gender identities. We also recruited patients falling outside these categories. Any patient living within the SMH catchment area and who self-identified with one of the categories was eligible to participate. Through our community partnerships, we identified key gatekeepers who could inform our recruitment and data collection and – through our partnership with them and engagement in a reflexive research approach[15] – foster a safe and respectful engagement process.

(see Table 1 for participant demographic details). Our reflexive approach is based upon published guidelines[15] elaborated throughout our methods section and includes actions like inviting an Indigenous knowledge keeper to the focus group focusing on Indigenous health to help foster cultural safety.

Data Collection

Three researchers conducted 15 one-hour semi-structured focus groups with care providers and patients. Care provider focus groups explored their understandings and practices relating to caring for disadvantaged patients, including probes about system influences. Examples of care provider focus group questions include: Who or what comes to mind when we say "disadvantaged patient"? How do you respond when caring for a disadvantaged patient? What enables you to care for these patients in the ways that you want to? We did not explicitly ask participants to list their perceived educational needs because we were focused less on content knowledge gaps and more on opportunities for humanistic and transformative education to support the goals of caring for DPP.[8]

Patient focus groups were held in community spaces familiar to participants. Patient focus groups sought and encouraged stories of general experiences with the healthcare system, including probes for positive and negative experiences, and what they wished healthcare providers knew. Patient focus group questions included: Are there any specific gaps you would like to see closed in terms of access to care? What would you like care providers to know about you?

Focus groups were digitally recorded and transcribed verbatim.

Data Analysis

We analysed our focus group data using a thematic analysis,[16] with the following questions: (1) What is the dominant discourse of DPP making sayable (i.e. socially acceptable, common, or 'normal') and unsayable? (2) What are the current ways to participate in the DPP discourse? (3) What activities are mobilized by the DPP discourse? These questions were informed by established theories about discourse, which tell us that language shapes and constrains social practices, knowledge and power. This way of questioning aligns with our transformative position that education is more than learning content knowledge; it is also about challenging assumptions and the status quo.[17] In uncovering the ways people speak about DPP we presumed we would identify education needs.

We first identified and coded relevant meaning units and created analytic memos in response to the guiding questions. The coded meaning units were then synthesized into main themes, again in relation to the guiding questions. Bi-weekly meetings with the analysis team (LB, EK, SN) guided the reflexive analytic process.[15] Analysis continued until the point of sufficiency, the point at which our coding was not leading to new insights.[18]

We used our findings as indicators of the remaining challenges to be addressed in relation to DPP in our organization. That is, we were looking for the assumptions embedded in the way DPP had operated and been acted upon as a starting point for continued improvement. Every innovation has unintended outcomes;[19] it was these unintended, discursive outcomes that we framed as outstanding "needs" in our system, which transformative education approaches actively seek to address.

Findings

We will present our findings in relation to our three main analytic questions, and from the standpoints of care providers and patients.

What is sayable and unsayable in the current DPP discourse?

The DPP discourse was apparent in our dataset as three sets of assumptions: (1) disadvantaged patients require care above and beyond what is considered normal; (2) the system is to blame for failures in serving disadvantaged patients, and (3) labeling patients is problematic and stigmatizing.

Disadvantaged patients require care above and beyond the norm. Care providers talked in terms of going above and beyond the call of duty in order to serve disadvantaged patients. This way of talking and thinking constructs a dichotomy between typical or regular patients and those experiencing disadvantage, and highlights exceptional effort and

specialized expertise as requirements of care for these populations.

I think, to some degree, we may put more effort, I would say, in people who are disadvantaged because, just as an example, the discharge will be more challenging. (Care Provider, 04)

As a result, clinicians, in the DPP discourse, are said to be "good" care providers when they are willing and able to provide this additional care.

The system is to blame for failures in serving disadvantaged patients. The DPP discourse makes sayable that no individual is at fault, but rather the problem lies within a system that struggles to meet the needs of all patients. Time constraints, lack of resources and support, and a convoluted, fragmented care system were highlighted as setting certain patients (and care providers) up for failure:

I think there's a tendency when people need more attention because of language barriers, cultural barriers, education barriers, or whatever it is to need a little extra time, but I think the system often responds by giving them less time. (Care Provider, 08)

I think it has to do with … the number of cases. They only give you a certain amount of time because there's so many people to see and so many diagnoses to make and reports to fill out. (Patient, 05)

Labeling patients is problematic and stigmatizing. The terminology surrounding 'disadvantaged patients' is resisted, to an extent, as problematic in and of itself. Care providers speak of the dangers of labeling, which they cautioned may further stigmatize, differentiate, and stereotype patients experiencing disadvantage:

I know like we try to use terminology to kind of label a situation or a group of people so it's easier to kind of capture information or the context, but sometimes by doing that, we kind of victimize the person and the individual or groups of people rather than look at the systemic issue. (Care Provider, 03)

Patients felt essentialised (as if their personhood was lost and relegated to a category of disadvantage), and thus othered (positioned as different from and lesser than) by the DPP discourse. Although patients recognized that access to care was enabled by the DPP discourse, they also noted that this increased access was accompanied by negative associations. The DPP discourse's dehumanizing side effects created a call, by patients, to be seen as human beings, first and foremost, rather than being identified by their disadvantage:

It seems like they forget that we [are] still human. They forget my name. Now I have a label of […]For some years I was even afraid to go to the doctor because … with those labels they just see an illness. (Patient, 07)

What are the current ways to participate in the DPP discourse?

Care providers participated in the DPP discourse as specialized DPP experts, advocates, and

system gatekeepers. Clinicians who address the 'additional' needs of disadvantaged patients are believed by colleagues to hold a particular set of values, cultural competencies, and expertise. They are positively framed as advocates and systems navigators for their patients, ensuring patients receive equitable and quality care:

I spend a lot of time helping, trying to show them or help them to identify their own strengths, and to empower their own voice, trying to help them advocate for themselves and learn those skills so that might be a slightly different role that I get to take on versus other settings. (Care provider, 02)

Care providers also act as gatekeepers, whether they are considered advocates or not. As gatekeepers they may either grant or deny access to resources from within or outside the healthcare system (e.g. forms for governmental benefits).

Patients participated in the DPP discourses either as desirable patients, or 'invisible' patients. Patients recognized that, at times, the system works against good care. Clinicians are busy and wait times are the norm for all. However, they explained that when you are seen as a "disadvantaged patient," accessing humanistic care can become all the more challenging. They highlighted how disadvantaged patients are often seen as 'difficult' patients. And in order to be 'a person worth caring for,' patients had to perform or play the role of the 'good patient':

I need to show that I'm not needy because if they get me on a bad day without makeup [...] in the

Emergency room and whenever I go […] I have to look like I'm a presentable lady. Because if there is any sign that I could be on social assistance even or be the working poor, ooh…(Patient, 05)

Participating in the DPP discourse required patients to be within one of the labeled groups listed in the strategic plan. That is, if you fit within one of the categories, you are able to access services. Therefore, patients who experience disadvantage beyond those six categories are in effect rendered invisible.

What activities are mobilized by the DPP discourse?

We saw three continua of activities, each ranging from intended to unintended consequences, mobilized by the DPP discourse: (1) a comprehensive care approach that could become inadvertently myopic; (2) resource creation that could lead to competition for said resources; and (3) positive rhetoric coupled with both action and inaction.

A comprehensive care approach that could become inadvertently myopic. The DPP discourse strives to provide more equitable, and thus comprehensive, care. However, when these well-intended goals become time and resource constrained, an unintended myopic approach to care can result instead. In this myopic approach, the disadvantage itself is targeted as if it is a singular impairment or diagnosis requiring treatment.

Targeting the disadvantage for treatment incidentally removes the complexity inherent in caring for a whole person. A consequence of myopic care – care that is well-meaning but too focused on disadvantage at the cost of caring for the whole person – is the inadvertent silencing of patients. Patients need a voice when their health and wellbeing is discussed; their knowledge and experience counts. Many stories demonstrated patients' experiences of not being heard or believed, of false assumptions (and errors based upon these false, stereotypical assumptions), and de-humanizing interactions with care providers:

He [the doctor] said, why are you here? And I said, I don't feel good. And before he did anything, like temperature or anything, he said, well, you can't get any narcotics. And I said, I don't want any narcotics, that's not why I'm here, I don't take narcotics. (Patient, 10)

Resource creation that could lead to competition for said resources. When an organization focuses on disadvantage at a strategic level, attention and resources are often (re)directed toward this new priority. This added focus and funding offer beneficial opportunities and advancements for patients experiencing disadvantage; but these new resources have their limits, and competition for a limited pool of resources thus ensues. Advocates for particular disadvantaged patient populations are inadvertently positioned against one another for access to these limited resources. Demonstrating the greatest need and best investment thus becomes a part of the DPP discourse.

Positive rhetoric coupled with both action and inaction. DPP as a discourse creates both internal and public messaging about the organization's goals, which could be experienced as both helpful and as a tension. Language and messaging can shape perspectives; thus these forms of communication can help engender value for caring well for disadvantaged patients. However, tension also arises, between academic concepts associated with DPP (e.g. cultural competence) and the everyday practice of care providers.

Instead of oversimplistic and individualistic concepts like cultural competence, care providers pointed to systemic changes as top priority (as noted in the *What is sayable and unsayable in the current DPP discourse* section), described a recognition of the workarounds they engaged in everyday practice, and suggested a move toward shared responsibility as one way to improve care for disadvantaged patients. For example, they emphasized a need for collaborative relationships between hospital and community-based clinicians, which sometimes required taking an innovative or novel path:

And you have to become more creative in finding resources or in finding ways to support them in the community. And at some point, as a team, I think at some point we have been very creative in looking at different ways, and sometimes taking the path less travelled. (Care provider, 04)

Patients can see discrepancies between well-intended rhetoric espoused on posters and screens throughout the hospital, and the actualities of care they receive. They are aware that by supporting disadvantaged groups they may be unintentionally

reproducing the disadvantage by singling them out. That is, they realize that the problems are complex and that efforts to help can inadvertently harm (e.g. by creating one-size-fits-all solutions for categories of patients, and perpetuating stigma):

We wanted to be identified as separate. We wanted to have a voice for ourselves. Well they gave it to us. It didn't kind of turn out the way we envisioned did it? (Patient, 07)

Discussion

The discourse of DPP – despite its espoused ideals of equity – serves to reinforce the social hierarchy that would need to be disrupted in order to achieve equity in health care. Without attention to power and social relations, categorizing patients into their most prominent sources of "disadvantage" risks positioning them as uniquely burdensome thus requiring additional effort from health professionals. This positioning separates the provider and patient rather than bringing them to a shared sense of understanding and responsibility. The categorization also further de-humanizes patients and leads providers to focus on discrete health or social issues rather than the whole complex person. While patients seem to recognize their disempowered position, providers may benefit from clearer awareness of their relationship to this disempowerment. With this awareness, they may be able to strive more toward sharing the responsibility rather than deferring blame to the system.[20]

Through a transformative paradigm of education,[8] identifying dominant discourses related to DPP offers clear paths for educational recommendations. The purpose of transformative education is to shift orientations and perspectives.[8,21–23] Therefore, identifying the dominant perspectives shows us where education can be helpful. Our discussion thus centers on the main problems identified in our needs assessment and opportunities that extant theory on transformative education and critical pedagogy offer in relation to these problems/needs. First, the DPP dominant discourse risks positioning disadvantaged patients as so distinct that they require exceptional effort. The unintended consequence of this positioning is a dehumanizing and 'othering' effect. Second, the DPP dominant discourse risks de-valuing the experiential and personal knowledge of both patients and providers, as corporate and strategic efforts can often unintentionally push aside the everyday knowledge and workarounds that are so core to truly compassionate and equitable care. And finally, the DPP dominant discourse risks narrowly defining equitable care and access to care such that the complexity and nuance they require is oversimplified. Thus assessment and evaluation outcomes for education risk falling into the trap of oversimplification and quantification that can reproduce inequity and poor access. Notably, access and equity must mean more than seeing a health provider and receiving medical treatment; they also mean being treated as valued human beings, just like any other patient.

The DPP "categories" at our organization align with current, popular education approaches that provide clinicians with the skills to identify the effect of social determinants on disadvantaged patients in a particular clinical encounter.[4,24] These approaches, however, but do not equip clinicians with skills and virtues to understand and change the broader structural contexts in which the encounter takes place. Our empirical findings support the theoretical assertions made in extant litearture[4,20,24] that teaching about the social determinants that cause certain individuals or groups to experience disadvantage, does not necessarily result in more equitable care. Our study saw care providers repeatedly citing 'systems' problems (i.e. knowledge of SDOH) for failures in serving disadvantaged patients, and experiencing little agency to enact change. Further, we saw DPP patients feeling singled out and dehumanized through such categorization and treatment. Sharma[4] has suggested that teaching care providers to be aware of the SDOH, without teaching about the unequal distributions of wealth, power and privilege that contribute to health disparities, risks perpetuating this status quo.[4] Sharma believes that when we categorize complex problems into DPP "categories" or lists of social determinants that affect people's health, we risk practicing under the assumption that they are "natural" and not a result of societal structures over which we have some control that create these inequities.[4] A critical approach to education is thus warranted.

Future directions and limitations

Future research may need to examine the potential of critical approaches to education to address some of the needs and problems we saw in this needs assessment. Critical theory-informed educators argue that if we want care providers to see social determinants as actionable items that they can do something about, then we need to re-orient our education towards critical pedagogical approaches.[4,21–23,26–29] The "critical" in "critical pedagogy" refers to a focus on questioning assumptions, attending to power relations, revealing the problems and opportunities these assumptions and relations may otherwise mask, and striving for transformation through positive change. The "pedagogy" in "critical pedagogy" refers to theories and practices of teaching and education.[30] Based on findings from our needs assessment, we believe the following three education approaches may be suitable underpinnings for further study as opportunities to use education to improve care for patients experiencing disadvantage. These approaches are informed by work in critical pedagogy[21,23] and are appropriate for academic hospitals in particular, wherein learning is largely experiential and workplace-based, and often pressed for time.

(1) Sharing authentic complex and varied stories in a range of safe, multi-media, and interactive formats. We suggest the theory-informed use of stories as a teaching approach.[31–35] Using stories, in a complex and ethical manner, can address the sense of 'othering' – being made to feel distinct and less than – felt by patients who experience disadvantage. Stories have the potential to shift our narrow focus from disadvantage being a fixed characteristic, residing within a human being (as we saw in our needs assessment), to the view of a whole person within which 'disadvantaged' is but one label.

(2) Fostering dialogue instead of directives and discussion. We suggest a move toward dialogue more often than discussion. The educational difference between dialogue and discussion has been explained by Kumagai and Naidu.[37] While discussion aims to arrive at a solution or consensus, dialogue aims to create questions and possibilities. It promotes the authentic exchange of ideas. "It begins in a safe learning space and invites learners to openly share their experiences without concern for judgment".[23] Rather than striving for a single, 'best solution' for a diverse group of unique patients, dialogue continually generates new questions and possibilities.[37] Dialogue can potentially thus help us honour the experiential knowledge and complexity of patients and practitioners and, in combination with stories, can help address the problems of patients lacking voice and losing humanity in the health system, as identified in our findings.[37]

(3) Aligning assessment and evaluation with education approaches. An organization's evaluation of staff and teams must align with its educational approaches;[38] assessments and evaluations must honour the complexity of care. As described above, we need education that inspires a continual questioning of both professional and institutional practices to ensure no deliberate or inadvertent harm is being done. If stories and dialogue are the educational approaches, then the assessments of learning and evaluation of programs must align with these education approaches.

Many reasonable and practical factors in an organization drive staff evaluation towards a standardized – resources, transparency, actual and perceived fairness and equitability -- an approach which of course has its merits.[40] Therefore, assessment and evaluative approaches that account for the complexity of care must find a balance between these potentially competing forces in the specific context of staff and trainees as learners and employees. This, we argue, is an area ripe for further study.

The local nature of our study, small sample sizes, and the fact that this inquiry was designed first and foremost as an organizational needs assessment limits its transferability to the broader literature yet allowed us to develop educational recommendations tailored to our specific context and potentially informative for others in similar circumstances. Future work should explore the relevance of our findings in other settings.

Conclusion

Our needs assessment allowed us to explore the discourse of DPP as it is understood in our hospital context and its resultant educational needs, and our

theory-informed approach to the needs assessment enabled us to identify educational approaches potentially well-suited to these types of educational needs. Based on the principles and practices of critical pedagogy, we identified and shared meaningful ways forward for education research to address the identified gaps. Our next steps involve exploring the implementation of our recommended education approaches within our organization. Critically, we need to find representative and paradigmatically aligned ways to meaningfully assess and evaluate this type of education.[8]

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Appendix A

Table 1. Participant details

Type of participant	Category	Number of participants
Care providers	Leaders	6
	Health disciplines	7
	Nursing	7
	Medicine	3
	Other	6
Patient	Mental health and addiction	5
	Homeless and Underhoused	9
	Indigenous	5
	Immigrant or refugee status	7
	Sexual orientation	1
	Gender identity	1
	General	4
Trainees	Health disciplines	3
	Nursing	2
	Medicine	4
Total		70

Canadian Medical Education Journal

Major Contributions

Assessing the quality of feedback to general internal medicine residents in a competency-based environment

Évaluer la qualité de la rétroaction chez les résidents en médecine interne générale dans un environnement basé sur les compétences

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Abstract

Construct: Competency Based Medical Education (CBME) is designed to use workplace-based assessment (WBA) tools to provide observed assessment and feedback on resident competence. Moreover, WBAs are expected to provide evidence beyond that of more traditional mid- or end-of-rotation assessments [e.g., In Training Evaluation Reports (ITERs)]. In this study, we investigated the quality of feedback in General Internal Medicine (GIM), by comparing WBA and ITER assessment tools.

Background: WBAs are hypothesized to improve written and numerical feedback to support the development and documentation of competence. In this study, we investigated residents' and preceptors' perceptions of WBA validity, usability, and reliability and the extent to which WBAs differentiate residents' performance when compared to ITERs.

Approach: We used a mixed methods approach over a three-year period, including perspectives gathered from focus groups, interviews, along with numerical and narrative comparisons between WBA and ITERs in one GIM program.

Results: Our quantitative analysis of feedback from seven residents' clinical assessments showed that overall rates of actionable feedback, for both ITERs and WBAs, were low (26%), with only 9% of the total providing an improvement strategy. The provision of quality feedback was not significantly different between tools; although WBAs provided more actionable feedback, ITERs provided more strategies. We found that residents and preceptors indicated the narrative component of feedback was more constructive and effective than numerical scores. Both groups perceived the focus on specific workplace-based feedback was more effective than ITERs.

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Conclusions: Participants in this study viewed narrative, actionable, and specific feedback as essential, and an overall preference was found for written feedback over numerical assessments. However, our quantitative analyses showed that specific actionable feedback was rarely documented, despite finding an emphasis from both residents and preceptors of its importance for developing competency. Neither formative WBAs nor summative ITERs clearly provided better feedback, and both may still have a role in overall resident evaluation. Participant views differed in roles and responsibilities, with residents stating that preceptors should be responsible for initiating assessments and vice-versa. These results reveal an incongruence between resident and preceptor perceptions and practice around giving feedback and emphasize opportunities for programs adopting and implementing CBME to address how best to support residents and frontline clinical teachers.

Élaboration: La formation médicale par compétences (CBME) est conçue pour utiliser les outils d'évaluation en milieu de travail (WBA) afin de fournir une évaluation formative et une rétroaction basés sur l'observationde la compétence des résidents. De plus, les WBA doivent fournir une preuve plus exacte que les évaluations traditionnelles à mi-cycle et en fin de cycle [p. ex. rapports d'évaluation en cours de formation (ITER)]. Dans cette étude, nous avons examiné la qualité de la rétroaction en médecine interne générale (GIM) en comparant les outils d'évaluation WBA et ITER.

Contexte: Les WBA sont pressentis pour être associés à une meilleure rétroaction narrative ou sur échelle quantitative pour appuyer le développement et la documentation de la compétence. Dans cette étude, nous avons examiné les perceptions des résidents et des superviseurs quant à la validité, l'utilité et la fiabilité de la WBA, et la façon dont les WBA différencient les performances des résidents par rapport aux ITER.

Approche: Nous avons utilisé une approche de méthodes mixtes sur une période de trois ans, notamment des perspectives recueillies auprès de groupes de discussion, des entrevues, et également des comparaisons numériques et narratives entre les WBA et les ITER liés à un programme de médecine interne générale.

Résultats: Notre analyse quantitative de rétroaction basée sur sept évaluations cliniques de résidents démontre que les taux globaux de rétroaction pertinente, pour les ITER et les WBA, étaient bas (26 %), et que seulement 9 % de ces deux types d'évaluation suggéraient une stratégie d'amélioration. La qualité de la rétroaction n'était pas très différente entre les outils; les WBA ont fourni plus de rétroaction pertinente, mais les ITER ont fourni plus de stratégies. Selon nos observations, les résidents et les superviseurs ont indiqué que la partie narrative de la rétroaction était plus constructive et efficace que les évaluations par échelles quantitative. Les deux groupes ont estimé que l'accent mis sur la rétroaction en milieu de travail était plus efficace que les ITER.

Conclusions : Les participants à cette étude ont estimé que les rétroactions narratives, pertinentes et spécifiques sont essentielles, et nous avons observé une préférence générale pour la rétroaction narrative plutôt que pour l'évaluation avec échelle quantitative. Cependant, nos analyses quantitatives ont démontré que la rétroaction pertinente spécifique était rarement documentée, bien que les résidents et les superviseurs insistent sur son importance quant au développement des compétences. Ni les WBA formatives ni les ITER sommatifs n'ont clairement fourni de meilleures rétroactions et les deux pourraient toujours avoir un rôle dans l'évaluation globale des résidents. Les opinions des résidents divergent de celles des superviseurs quant aux rôles et les responsabilités : les résidents affirment que les précepteurs ont la responsabilité d'initier les évaluations, et vice versa. Ces résultats révèlent une discordance entre les perceptions et les pratiques des résidents et des superviseurs quant aux rétroactions à apporter. Ils mettent également l'accent sur les opportunités pouraux les programmes qui adoptent et implantent la formation médicale par compétences pour trouver la meilleure façon d'appuyer les résidents et les enseignants cliniques sur le terrain.

Introduction

In 2015, the Royal College of Physicians and Surgeons of Canada (RCPSC) announced the implementation of a Competency by Design (CBD) initiative that was developed within a competency-based medical education (CBME) approach.[1] Although CBME is a relatively new initiative in Canada for Royal College Specialties, the College of Family Physicians of Canada and other nations have been engaged in this approach to residency education for a number of years.[2–5] Findings across these settings indicate that

while the idea of CBME is popular amongst trainees and assessors, it is not without challenges, including residents being resistant to increased observation and feedback,[6–9] and preceptor concerns that CBME will be more time-consuming and onerous.[10–13]

The goal of assessment in medical training is twofold. First, if it is delivered properly, assessment drives the learning process.[14,15] Second, it also provides important documentation of performance and overall resident competence, regardless of whether a program is structured in a traditional time-based format, or in a competency-based format. With the global shift towards CBME, there has been a parallel shift towards implementing workplace-based assessment (WBA).[11,16] WBA refers to frequent, formative, and criterion-referenced clinical assessment.[17,18] Grounded in adult learning principles[19–22], a CBME approach using WBAs promotes self-directed learning early in residents' medical training.[17,23,24] These formative assessments also offer timely opportunities for preceptors and academic advisors to identify and coach residents who are in difficulty. The CBD framework must provide sufficient competency data to validly and reliably assess resident competence. Determining which types of assessment tools will be most effective, and how best to implement them, remains a challenge in medical education.[9,11] WBAs are believed to improve timeliness and specificity of assessment and to prompt actionable feedback at the time of a clinical encounter.

Feedback is considered effective if it fosters ongoing resident learning through these qualities descriptive, narrative, task-focused, specific, criterion-based, timely, constructive and actionable.[17,25] Constructive and actionable feedback are described as providing direction for improvement including identifying a specific area or strategy for action[25]. This type of feedback attributes residents' performance to controllable behaviours that allows residents to progress towards a learning goal[26–29]. This type of quality feedback is especially important in a CBME environment where learning is more resident-centred and preceptors are "expected to directly observe trainees and provide context-specific, behaviorally based feedback to learners".[30] There is a gap in knowledge about whether formative WBA provide improved documented feedback as compared to traditional summative ITERs.

The purpose of this study was to determine whether, within one postgraduate medical subspecialty training program, there was a difference in the quality of feedback between summative ITER assessments that characterize a pre-CBME environment and the formative WBAs that will characterize the CBME model. Our research questions included,

1. How does the perceived and assessed quality of feedback differ with the implementation of the WBAs?
2. To what extent were the assessment tools perceived to be usable, valuable and feasible?
3. In what ways did WBAs document the development of a resident's competence?

Context

The General Internal Medicine (GIM) program at Queen's is a two-year medicine subspecialty program of PGY-4 and -5 trainees. GIM began preparing for the implementation of CBD assessment processes in 2015 by designing and implementing several rubric-based assessment tools. Rubrics assessed between 1-15 skills (if observed), across seven CanMEDS Roles.[31] Traditional ITERs were updated but continued to be used as WBAs were introduced. Appendices A and B provide examples of a representative ITER and WBA tools, respectively.

GIM preceptors and residents received background information on CBME and workplace based assessment, as well as training on when and how to complete the new forms. Emphasis was placed on providing constructive, narrative feedback on any assessment form. Regular email reminders were sent to complete WBA in certain clinical environments (e.g. longitudinal GIM clinic). Each resident was assigned an academic advisor (who at the time of this study was the program director), who met with the resident at three month intervals to review the assessment portfolio, summarize progress, and provide longitudinal coaching, in the model originally suggested by the RCPSC.

Methods

We used a mixed methods analysis with a concurrent triangulation design in this study.[32,33] We supported

assessment effectiveness by a retrospective quantitative analysis of assessment scores with a qualitative analysis of preceptor narrative assessment feedback spanning four years (2013-2016). We juxtaposed narrative data from interviews and focus groups with assessment data to provide a rationale for evaluation outcomes and to recommend future improvements to residency assessment.

Setting and participants

GIM at Queen's is a mid-sized medical subspecialty training program with seven PGY-4/5 residents and 11 GIM preceptors at the time of this study (2015/2016). The residents performed rotations in a wide variety of medical contexts, many with non-GIM rotations and assessors (e.g., stress testing with a cardiologist, or a radiology elective). Assessment data was collected across a number of contexts from residents, and from a variety of GIM and non-GIM preceptors. We conducted this research between January 2016 and January 2017 in the lead up to formal CBME implementation. Ethical approval was provided by the Queen's University Health Sciences Research Ethics Board.

Data collection

Both qualitative and quantitative data were collected. For the qualitative data, participation by both residents and preceptors was voluntary. Quantitative assessment data were collected prior to conducting the interviews and focus groups to ensure assessments were not influenced by interview and focus group discussions.

Using convenience sampling, resident interviews were conducted with four of the seven residents who agreed to participate in the study (two PGY-4s and two PGY-5s). The PGY-4s had been exposed to both WBAs and ITERs whereas the PGY-5s had been exposed to mainly ITERs in their PGY-4 year, and to both ITERs and WBAs in their PGY-5 year. The interviews were between 30-55 minutes in length.

Seven of nine GIM preceptors (78%) agreed to participate in two focus groups (n=2; n=5), one before and one following the resident interviews. Residents and preceptors participated separately in the study to ensure both groups felt able to speak freely and critically. Focus groups were 60 minutes in duration.

Expert research interviewers who were not associated with the GIM training program and had extensive experience with qualitative research conducted the interviews and focus groups. One researcher external to the department conducted all the interviews, while a second external researcher conducted the focus groups. Both external researchers attended the focus groups, one conducted the focus groups and the second took notes, identified preliminary themes, and summarize findings for participant verification. Guided by the literature, the research team developed the focus group guide (protocol) and revised the questions based on the results of the first interview.

The protocols targeted three key areas including, 1) residents' and faculty perspectives on requirements for quality feedback, 2) differences between formal and informal feedback, and 3) the perceived usability, feasibility, and value of the WBA tools (see Appendix C for protocols). All interviews and focus groups were audio recorded and transcribed verbatim. Pseudonyms replaced identifiable information to protect participant confidentiality.

Quantitative data consisted of numerical resident assessment data and were collected before conducting the interviews and focus groups to ensure feedback forms completed were not influenced by the interview and focus group discussions. These quantitative data were organized into spreadsheets and data cleaned to enable statistical analyses. We quantified all written feedback from the resident assessment tools as not-actionable, actionable, or actionable with strategy. If the feedback described the competency of a specific task it was coded as "actionable", if a specific strategy for improving the task was provided it was coded as "actionable with a strategy". If the behaviour or skill was not identified it was considered not-actionable (e.g. "great work"). Actionable with strategy was considered more beneficial (see introduction) as it assists residents' ability to self-regulate their learning.[34–38]

Data analysis

Our analysis began by entering the data for all assessments completed between 2014 and 2016 into our statistical software (SPSS v21) for descriptive and inferential statistical exploration and testing. After data was inspected for outliers, typos, and normality (ANOVAs) inferential statistical analysis was conducted. Chi-Squared tests were used to test if there were statistically different feedback provided

across assessors and assessment categories as a means of showing differences in quality or other factors. Phi coefficients (ϕ_c) were calculated to determine the level of association between assessors and the quality of feedback provided. A Factorial ANOVA was used to test for differences between assessors and their average scores and partial-eta-squared effect sizes (η^2) were calculated to demonstrate magnitude of difference.

We conducted qualitative analysis using a thematic design after all data were collected as a means of identifying perceptions about the current assessments and process, and strategies for future improvement.[39] Using open coding, two researchers independently coded one interview and one focus group to ensure inter-rater reliability and formulate the codebook (91.35% of coding was the same and 8.65% of codes were changed with consensus for the reliability of meaning). We merged the 473 codes across all the interviews and focus groups into 28 distinct super-codes, 13 categories, and 4 themes through research team meetings until consensus was reached. We triangulated all data to ensure a connection between both the quantitative and qualitative results. The quantitative results are embedded into each theme in the results section when there is a direct relationship to the qualitative data.

Results

Figure 1 depicts the number of assessment tools included and excluded in this study. The 11 GIM preceptors performed 55% of these assessments (180/328), whereas 57 non-GIM preceptors performed the remaining 45% of assessments (148/328).

We found that four themes emerged from the mixed method analyses: (1) Desiring targeted, formative feedback; (2) Addressing usability, reliability and value of assessment tools; (3) Identifying who is responsible for initiating assessments; and (4) Synthesizing summative and formative feedback to assess resident competence. Quantitative data are included within each of the themes where there is a specific link in order to provide additional evidence that supports the findings. Tables 1, 3-5 provide the topics within each theme with selected quotations.

Theme 1: Desiring targeted, formative feedback. As pertinent to research question 1, participants expressed a desire for targeted, narrative, formative and constructive feedback. ITERs were seen by both preceptors and residents as having minimal effectiveness with the exception of the comments section which was seen as valuable. Residents were unanimous in the belief that the narrative component of the ITERs was more effective than scores on a numerical scale for providing constructive feedback. The WBAs were viewed as more useful as they were more likely to provide information about resident progression through the training program. Both residents and preceptors believed the focus on written comments through the WBAs was a more effective assessment. Most participants noted that WBAs were more effective than ITERs at providing feedback based on the resident level, timeliness and specificity.

All residents distinguished between the formal and informal feedback that they received. Informal feedback was preferred; it was timelier and tended to occur soon after the direct observation, whereas formal feedback was viewed as less timely. The majority of participants described the logistical challenges of written feedback in a busy clinical environment. Both residents and preceptors identified the importance of an academic advisor in providing residents with targeted, actionable feedback.

There was a contradiction, however, between the perceived actionability and specificity of WBA assessment feedback, and non-significant statistical differences between the two types of assessment. Across the six high frequency tools with identifiable assessors, preceptors provided written feedback 74% of the time (243/328). The extent of feedback was not differentiated by tool type as both ITERs and WBAs returned similar amounts of feedback that was actionable, and actionable with a strategy, as indicated by a Chi-Square test ($\chi^2 = 2.69$, $p = .261$). As well, there is no relationship between the numerical scores received on assessments and actionable feedback as all the residents scored high consistently indicating that none of the tools were discriminatory (Table 1).

Figure 1: Study inclusion and exclusion criteria of assessment tools

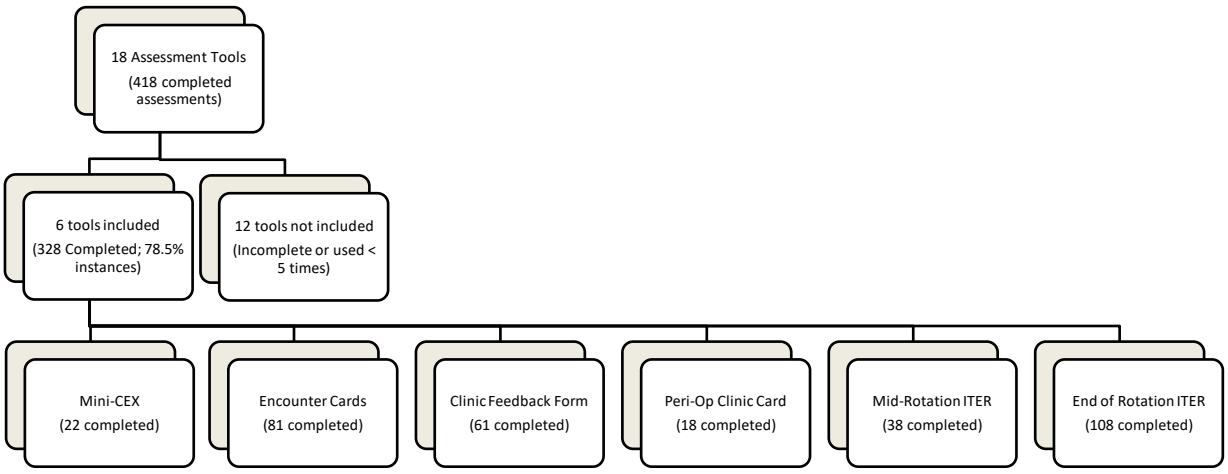

Table 1. Occurrence of actionable feedback

Tool	Feedback		
	Written Feedback	***Actionable*** "I have encouraged him to continue reading around ECG and stress test interpretation to achieve mastery of the subject."	***Actionable (with a Strategy)*** "Subscribe to [a journal] watch application to know what is going on in the field"
WBA	132/182 (71%)	46/182 (25%)	19/182 (10%)
ITER	111/146 (0.76)	38/146 (26%)	17/146 (12%)
Total	243/328 (74%)	84/328 (26%); $p >$ 0.1	36/328 (11%); $p >$ 0.1

Twenty-one of 72 physicians (29%) accounted for the provision of all actionable feedback and 68% (222/328) of all assessments completed. Of the top 10 most frequent preceptors, nine were core GIM faculty while the 10th was a chief preceptor of a community-based rotation. Twenty-one percent of the total number of assessors were GIM faculty and they contributed to 55% of the six assessment tools used in this study. There was a significant association between assessors and the provision of actionable and actionable with strategy feedback (χ^2=41.22, df=18, p<.001, and ϕ_c=.318 and p<.001). To determine if score ranges differed significantly across the 10 high frequency assessors, an ANOVA was used to determine the relationship between assessors and average scores. There was a significant difference between assessors and average scores (F(9, 213)=12.49, p<.0001, η^2=.345) which is commonly understood to constitute a large effect size. Among the top 10 assessors, there was an uneven distribution of assessments per resident. For example, Resident-3 had 12/28 assessments provided by Preceptor-23 and none provided by Preceptor-9 despite the fact that Preceptor-9 provided the highest number of assessments to residents overall. Given the large number of assessments performed by Preceptor-9, it is extremely unlikely this avoidance was random.

Table 2. Theme 1 selected quotations

Theme 1 Selected Quotations
The only useful thing in the ITERs was the comment section…. Whereas, the WBAs will create a small movie for you on how you are progressing. It actually gives you direction on how to improve the skills sets that you are lacking so you become better at being a physician…. The informal assessments are more useful than the formal ones during the ITERs. (I-Bryan)
If the attending or the evaluator filled out the comments [on the ITERs] that would be useful for me to change something or to improve on it. (I-Dalia)
The one thing that I like about ITERs is…the narrative component at the end. When you have time to reflect on a few clinics or a few experiences with someone, you can get slightly different perspective and information…. [WBAs are] really data moments for the bigger conversation…. You need time. I observe one and I lose track of the other seven.. (FG1)
I've found that the feedback doesn't really make all that much sense until someone else pulls it all together…. Sometimes you get that five second feedback but then you have to run off…. It is just not practical to be quite honest. (I-Allison)
It really takes that overarching person to [state that], 'On the last four rotations people have commented that your communication skills are a challenge, so why don't you work on that going forward?'. (FG2)

Going forward, they have identified areas which are for our level [about] where we should be aiming to improve our knowledge or our practice in the future. It isn't necessarily areas of deficiency but expected areas of improvement for everyone going forward. (I–Fiona)

Theme 2: Addressing usability, reliability and value in assessment tools. In addressing research question 2, resident and preceptor needs for improving the quality of feedback related in part to the usability, reliability, and value of the assessment tools. Within these dimensions preceptors noted the importance of understanding how to incorporate numerous points of feedback from multiple sources and to overcome barriers associated with reacting to constructive feedback.

Residents believed that assessors rushed to complete narrative feedback since it was always the last section on WBAs. To overcome this challenge, many participants suggested that providing prompts in the 'comments' section of the tools, would increase the feasibility and usability of assessment forms. Preceptors also stated that, at times, they required additional time to write thoughtful feedback, rather than attempting to write quality comments in-the-moment. Many participants believed that given the current clinical environment, it was not always feasible to give timely feedback in an appropriate setting, and may decrease the reliability of comments between assessors.

All participants were more approving of the new WBAs and their potential to improve useful feedback.

Differentiation based on written feedback was shown to be essential for overall assessment and coaching of residents due to the lack of performance differentiation and ceiling effects found across numerical assessment scores. For ITER's, 100% of Mid-Rotation assessments and 71% of End-of-Rotation ITERs received a perfect score. WBAs received a weighted average score of 87.5% with a total of 75 perfect scored (41% of the total WBAs). ITERs received a weighted average of 86.8% with a total of 44 perfect scored (30% of total ITERs). A comparison on the average scores of the seven CanMEDS roles resulted in no significant difference between tools.

Table 3. Theme 2 selected quotations

Theme 2 Selected Quotations
You have to make it [assessment tool] short and sweet. At most there should be three little things [that] someone can check off. The rest…[they] have to write a comment. Any generalized comments [are] not helpful. I would say, 'Today was there anything in the clinical situation that they could have changed their decision making?' (I-Allison)
I think what I struggle with is that I usually want to put a bit more thought into the feedback. (FG2)
I don't think it is feasible [to complete an assessment] every time. I don't think that is possible…with the current model of work that we are doing…. I have had instances with residents where I am giving them what I feel is very constructive feedback. They are so offended by the conversation because their expectation was different that I don't actually feel that they are actually benefiting from what I am saying to them. (FG1)
The WBA's have the potential of giving you directed on-site feedback as long as you get observed…. That is the biggest factor involved in making sure that the feedback is actually useful. (I-Bryan)
I would prefer the process the way it is now where we get more observation and it is based more on tasks and more regular assessments. (I-Fiona)
I thought that was a nice way of having feedback that was not just one snapshot…. It was more, 'Overall, here is where you are at'…. I still find it difficult [to receive constructive feedback] because I take it personally or as criticism. (I-Dalia)

Theme 3: **Identifying who is responsible for initiating assessments.** Aligned with research question 2, the need to explicitly identify the roles and responsibilities for the resident assessments emerged from the data and included identifying responsibility for initiating assessments and the willingness of some assessors to complete the WBAs. Most residents believed that the preceptor should be responsible for initiating the assessments. Residents reported feeling uncomfortable initiating the feedback process due to the possibility of a negative assessment and not knowing the assessor during short rotations. Preceptors agreed that narrative feedback was important, however, in contrast to the resident perspective, they suggested that the residents should be the initiators. They felt that this was currently not the case. Although, some preceptors showed concern that full autonomy would result in residents targeting assessors who provide only positive feedback.

Most residents felt that the willingness to provide feedback differed greatly between preceptors. They suggested that the more interested a preceptor was

in the teaching and learning process, the better they were at providing effective feedback. Both residents and preceptors agreed that there was a need to improve the quality of feedback. Finally, participants described the importance of receiving multiple sources of feedback—not only from preceptors but also from allied health professionals, which in turn, provides a more complete assessment of their strengths and weaknesses.

Table 4. Theme 3 selected quotations

Theme 3 Selected Quotations
I am scared of getting bad feedback…I find it hard to ask for feedback…the 360 perspective. (I-Fiona)
But that was mostly attending based. I did not get any feedback from patients or Allied Health services or other people…. Some preceptors were interested [in providing feedback] and other were not…. I think it is just how much they are involved in the teaching or involved in the learning…. I find that some of the ITERS…are very vague…. They will just write little things about you but it is very vague. (I-Bryan)
"In my experience [it is] not very frequently that a resident will approach me and ask for some specific feedback for a specific episode…. I think one of the challenges is going to be if the model becomes resident-driven… They will pull out the card [WBA] when they have done a good job. You are not going to say, 'I performed this code abysmally can you evaluate my performance?' (FG2)

Theme 4: Synthesizing summative and formative feedback to assess resident competency development. As pertinent to research question 3, the results demonstrate the importance of incorporating both point of care and longitudinal feedback when making decisions about a resident's competence. Most participants agreed that longitudinal feedback was a valuable component of a robust assessment portfolio. The ITERs and WBAs together, were viewed as a more complete method of assessment than the ITERs alone. Many participants were satisfied that the WBAs could provide support for the ITER data. They felt that the WBAs bridged the practice-feedback latency gap caused by ITERs. The ITERs allowed preceptors to comment on trends of performance, whereas WBAs provide data points demonstrating an overall pattern en route to a resident's development of competence.

Table 5. Theme 4 selected quotations

Theme 4 Selected Quotations
I feel like each of them, on their own, has pros and cons. Ideally, there would be some sort of blend of the two where you would get the whole picture. (I-Dalia)
I think each has its own advantages, ITERS do somethings well and WBAs do other things, you'd need them both. (FG2)

Discussion

In line with finding from contemporary literature, our qualitative data described the importance of timely, high quality feedback, and the potential for WBAs to be more effective than ITERs in this regard. [40,41] However, our quantitative results showed there was no difference in the quality of feedback documented between the two methods. The scores residents received on both assessments were near the highest of the scale with little standard deviation, and are unlikely to differentiate between resident capabilities or provide meaningful feedback to the trainees on areas to target for improvement. This was true whether traditional scales (does not meet/meets/exceeds expectations) in an ITER format, or a three-point scale using behavioural anchors (not yet/almost/achieves) in a WBA rubric format were used. This corresponds to findings from the participants, who felt that numerical scores did not provide useful feedback whereas the written comments were the deepest source of value. Qualitatively, one might expect WBAs to provide narrative snapshots of a resident's performance, with granular bits of specific formative feedback based on the case at hand or the experience of the day. In fact, our results demonstrated no difference in the frequency or quality of actionable feedback provided to residents, using traditional ITERs versus newer WBAs.

This lack of difference between assessment tool types may imply that the provision of high-quality feedback has more to do with preceptor development and the culture of assessment and feedback, than with the assessment tools themselves. Both residents and preceptors in this study expressed a desire for guidance in how to best implement and operationalize feedback strategies. Traditional thinking in regard to fostering a culture of feedback has focused on preceptor and resident development to improve the giving and receiving of feedback,[10] but

Harrison and colleagues offer novel ideas around structuring programmatic assessment to improve students' receptivity to feedback, including themes of emphasizing trainee personal agency or autonomy, and maintaining authenticity and relevance to practice environment when developing assessments.[42] These factors should be taken into account when developing assessment tools and strategies for implementation. Literature shows the negative influence that summative assessments can have on receptivity to feedback and this will require close consideration moving competency-based assessments forward[42,43]

Our results showed that providing timely, constructive and actionable feedback in a safe environment was also seen as essential in a CBME culture, although this type of feedback was rarely given. Administrative support in terms of creating schedules that allowed for completing WBAs, and preceptor development on what constitutes quality feedback will be important if the culture of assessment is to truly shift. Finally, the academic advisor system for collating assessments and interpreting results in terms of competency development was seen as valuable for resident understanding of their learning.

Our data also reveal a disconnect between residents and preceptors regarding the responsibility for initiating WBAs. Each group thought the other should be the one primarily responsible for initiating feedback and completing the WBAs. This is an important issue to recognize and address, as it is frequently proposed that CBME will be a learner-driven process.[44,45] Preceptors in our study suggested the need for a schedule such that residents do not 'cherry pick' their assessors, while also ensuring preceptors complete a required number of assessments for the residents they supervise. Our research showed an uneven distribution of completed assessments between some residents and preceptors. This may be due to the scheduling of resident rotations which does not always ensure equal pairing of residents and assessors, but certainly raises the possibility of cherry picking.

Finally, the results show a discrepancy between preceptors who consistently provide high quality feedback and those who do not. Both residents and preceptors clearly articulated the value of an academic advisor, or long-term mentor, in helping them translate feedback from assessments into learning and personal development. This person plays a critical role in helping residents see patterns of feedback, putting formative assessment in an overall context, and ultimately helping them reflect, accept and act on feedback.

Our results suggest a need for further professional development with preceptors, academic advisors, and residents, on both the process for using WBA tools, and on how to effectively deliver and interpret actionable feedback from a spectrum of evaluations.

Limitations

This study took place in a single division at one hospital site with a small sample size. Therefore, generalizability of our findings to other contexts should be made with caution. We feel that the emergent themes from our study are important and relevant, however it is certainly possible that additional themes would emerge by replicating this study across specialties. Faculty training within this single division could also be improved given the evidence provided that the tool used mattered less than the assessment or feedback skill of faculty.

Conclusion

Constructive, formative, narrative feedback is an important element in medical training programs, both to drive trainees' learning and to document resident progress and competence, as recognized by both preceptors and residents. WBAs are regarded highly as a tool for narrative and more frequent feedback. However, in our study of WBA compared to traditional ITER assessments, there was no difference in the documentation of specific actionable feedback, which was low in both assessment types. This demonstrates that simply creating WBA tools does not necessarily translate into more explicit or actionable feedback for trainees, an important concept to consider as many medical training programs begin the transition to CBME. This may reflect the need for preceptor development, and addressing the culture of learning and feedback which is independent of assessment tools.

Practice points

- Targeted, narrative, formative and constructive feedback is desired for CBME.

- Address both preceptor and resident needs if the goals of competency-based assessments are to be reached.
- Identify roles and responsibilities of those charged with completing competency-based assessments if the competency-based assessment system is to be effective.
- A process for synthesizing both formative and summative resident feedback is needed for making competency development decisions.
- Successful integration of CBME takes thoughtful systemic development and dedication at all levels of the adoption and implementation process.
- It is important for residents not to cherry pick their preceptor to skew their WBAs.

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Appendix A - An In-Training Evaluation Record (ITER)

Assessors were asked to comment on a resident's competence after a rotation by filling out the below assessment form. There was an additional space for a narrative description or qualitative comments.

CanMEDS Enabling Competencies		N/A	Rarely	Developing	Usually	Always
ME 1.3, 1.4, 2.1, 2.2, 4.1, Comm 2.1, 2.2	Demonstrates the required medical knowledge, skills and expertise to perform a thorough and appropriate assessment of a patient presenting with acute medical illness					
ME 1.6, 2.1, 2.2, 3.1	Demonstrates consultant-level clinical reasoning and judgement *(eg. DDx appropriately broad or narrow, without anchoring, reassesses initial impressions or plans when new information available, asks the right clinical questions)*					
ME 1.4, 2.3, Lead 2.1	Understands indications for admission and discharge from an acute medical service, and triages appropriately to the medical short stay unit, regular ward, ICU or discharge home from ER					
Lead 2.1-2.2	Thoughtfully chooses investigations that are relevant and necessary, not excessive (ie. Chooses wisely)					

Considering how the fellow's performance met (or did not meet) the statements above, please take the time to provide some narrative feedback. *This is the most important part of the ITER.* All feedback should be viewed as formative and constructive, and only one part of a global, multimodal system of assessment.

Please comment on areas of strength; this may be general feedback, or based on particular patient encounters or areas where the fellow demonstrated particular skill:

Please comment on areas for potential growth; this may be general feedback, or based on particular patient encounters or observed patterns where the fellow could improve:

Appendix B - An example of one of the WBA tools (Encounter Card)

Assessors were asked to complete the following encounter card directly after observing the resident in a clinical setting on a specific case.

GENERAL INTERNAL MEDICINE PATIENT ENCOUNTER CARD

Instructions: Please consider one particular patient encounter when completing this form. You do NOT need to comment on every item. ***Please use this as an opportunity to give on the spot feedback on the fellow's performance, with suggestions for future improvement.***

Case Difficulty: ☐ Simple: ☐ Complex but frequently encountered: ☐ Complex and infrequently encountered:
GIM Fellow: _____ Date: _____ Supervisor: _____

		Opportunities for growth: Close supervision	BL = *Borderline low* BL	Developing: Supervision on demand	BH = *Borderline high* BH	Achieving: Supervision for refinement
Medical Expert	History / Physical	☐ Misses basic, relevant information OR gathers irrelevant details ☐ Did not elicit info about triggers/risk factors /comorbidities, or corroborative info	☐ ☐	☐ Focused and concise ☐ Elicited partial info about triggers/risk factors/comorbidities, but required prompting	☐ ☐	☐ Identified pertinent risk factors and acquired details, sought corroborative info as required ☐ Identified possible triggers/comorbidities, sought corroborative info as required
		☐ Omitted basic P/E manoeuvres. ☐ Misinterpreted physical findings.	☐ ☐	☐ Performed basic P/E manoeuvres ☐ Identified findings relevant to problem formulation.	☐ ☐	☐ Performed complete relevant physical exam ☐ Identified signs and symptoms and integrated their relevance.
	Clinical Reasoning	☐ Inaccurate/incomplete knowledge ☐ Differential diagnosis misses important items or is not linked to particulars of case	☐ ☐	☐ Demonstrated knowledge of the topic ☐ Appropriate differential with prioritizing for simple or complex but frequent cases	☐ ☐	☐ Presented thorough knowledge of the topic ☐ Appropriate differential diagnosis, with discriminating features of case identified to rule in/out items
		☐ Applies patterns rigidly with limited consideration of individual patient	☐	☐ Adapts clinical reasoning to individual patients but may ignore findings that conflict with diagnosis	☐	☐ Maintains open mind, establishes working diagnosis and identifies potential findings that could signal alternative diagnosis
	Investigations / Management	☐ Proposed irrelevant or incorrect investigations ☐ Misinterpreted results	☐ ☐	☐ Identified investigations, but use may be indiscriminate. ☐ Correctly interpreted results	☐ ☐	☐ Strategic use of investigations (e.g., justifiable cost/benefit) ☐ Results of investigations informed management (e.g., makes sense of all info)
		☐ Proposed incorrect treatment or inadequate management plan ☐ Did not anticipate prognosis	☐ ☐	☐ Managed simple & complex but frequently encountered diagnoses ☐ Had sound expectations about prognosis	☐ ☐	☐ Managed treatment for complex and infrequently encountered diagnoses ☐ Articulated plan for unanticipated prognosis
Communicator		☐ Did not respond to patient/family's need for info/support	☐	☐ Discussed initial plan of care with patient/family	☐	☐ Provided on-going info/support to patient/family
Leader		☐ Did not consider impact of clinical decisions on staff, colleagues, facility	☐	☐ Considered impact of clinical decisions on staff, colleagues, facility	☐	☐ Involved staff in problem solving resource constraints, ward challenges, admin concerns
Scholar		☐ Did not consider available guidelines or evidence (e.g. Stroke, Hypertension) ☐ Missed opportunities to support others' learning	☐ ☐	☐ Considered available guidelines or evidence (e.g. Stroke, Hypertension) ☐ Responded to less experienced learners' questions	☐ ☐	☐ Adapted guidelines or evidence to specific needs/ circumstances of patient ☐ Guided less experienced learners to complete tasks
Professional		☐ Avoided responsibility for patient care	☐	☐ Acknowledged patient care responsibilities	☐	☐ Accepted responsibility for patient care

Global assessment: Would you trust this resident to perform this activity unsupervised next time? ☐ Not yet ☐ Almost ☐ Yes
Comments: _____

Appendix C: Interview and focus group protocol

General Internal Medicine Assessment Interview/Focus Group Protocol

[This version was for Faculty, word substitutions of Preceptors to Residents were made when interviewing Residents]

Please take a moment to read and sign the consent form.

Dimension 1: General satisfaction with feedback

What is the most common way you provide feedback to residents?

What other types of feedback do you provide?

Does the type of feedback you provide differ for residents at different stages of their training?

Do you think the residents find the feedback they receive effective?

Is formal or informal feedback more effective? Why?

What makes feedback effective?

[Probes: Consider asking about Specific, Measurable, Attainable, Relevant, and Time Bound]

[Consider] What makes feedback effective? (Probes: timely, feasible, informative, constructive)

Dimension 2: Attitudes about feedback

When feedback is effective how do you think it makes residents feel?

From your perspective, what makes feedback ineffective?

When you have provided ineffective feedback, how do you think it made residents feel?

Do you think it's possible to always give and receive effective feedback? Why or why not?

Do you think residents are in a position where they feel they can ask for specific feedback on a given task or skillset?

Is it typically feasible to provide specific? Can you provide an example?

What might put you in a better position to provide residents with feedback?

To what extent do ITERs and WBAs enable directed feedback?

Do residents think that *you intend* your feedback to be coaching or criticism?

Do you think *residents perceive* the feedback you provide as coaching or criticism?

Is there a difference between the ITERs and WBAs in terms of whether feedback comes across as coaching or criticism?

Please provide an example

Please consider both the ITERs and the WBAs. Which one do you think is more helpful?

Why do you think this from your perspective?

Was feedback from one tool more feasible than the other? If so, how?

Do you think ITERs and WBAs are fundamentally different?

How would you describe any differences?

Dimension 3: Applicability of feedback

To what extent is feedback provided by the WBA or ITERs more timely?

What are the barriers to providing timely feedback?

Is there a way to make feedback more timely?

Please describe how feedback provided by ITERs and/or WBA allow residents to set learning goals, and determine if you have obtained them?

Do these tools help residents identify areas where there is opportunity for growth?

Do they help residents determine areas for improvement in the future?

In what ways do you feel residents would be able to *advocate for their progression* **through the residency program based on feedback from WBA and ITERs, if at all?**

Would one assessment be more useful than the other at enabling residents to advocate for progression through the program?

Have you found that the feedback from the WBA and ITERs is specific to areas of residents' concern? If so, what areas of concern?

Can you provide a specific example when this was the case?

Is the feedback residents receive from WBA and ITERs specific to their personal performance?

Is there a difference between the two tools?

Do you feel that feedback provided from WBA and ITERs is sufficient to highlight areas of strength?

Do you feel that feedback provided from WBA and ITERs is sufficient to highlight areas where improvement is needed?

Is it personalized, or more generic?

Do you think personalization for each person is feasible? Why or why not?

Canadian Medical Education Journal

Major Contributions

Managing cognitive load in simulations: exploring the role of simulation technologists

Gestion de la charge cognitive en simulation : étude du rôle des technologues en simulation

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Abstract

Background: Facilitating simulation is a complex task with high cognitive load. Often simulation technologists are recruited to help run scenarios and lower some of the extraneous load. We used cognitive load theory to explore the impact of technologists on instructors, identifying sources of instructor cognitive load with and without technologists present.

Methods: Data were collected from 56 simulation sessions for postgraduate emergency medicine residents. Instructors delivered 14 of the sessions without a technologist. After each session, the instructor and simulation technologist (if present) provided quantitative and qualitative data on the cognitive load of the simulation.

Results: Instructors rated their cognitive load similarly, regardless of whether simulation technologists were present. However, the composition of their cognitive load differed. Instructors experienced reduced cognitive load related to the simulator and technical resources when technologists were present. Qualitative feedback from instructors suggested real consequences to these differences in cognitive load in (1) perceived complexities in running the scenario, and (2) observations of learners.

Conclusion: We provide evidence that simulation technologists can remove some of the extraneous load related to the simulator and technical resources for the instructor, allowing the instructor to focus more on observing the learner(s) and tailoring the scenario to their actions.

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Résumé

Contexte : Faciliter la simulation est une tâche complexe qui comporte une charge cognitive élevée. Des technologues en simulation sont souvent recrutés pour aider à exécuter des scénarios et à alléger la charge extrinsèque. Nous avons utilisé la théorie de la charge cognitive pour explorer l'impact des technologues sur les instructeurs, en identifiant les sources de la charge cognitive de l'instructeur avec et sans la présence du technologue.

Méthodes : Les données ont été recueillies à partir de 56 ateliers de simulation auprès des résidents en médecine d'urgence. Les instructeurs ont animé 14 de ces ateliers sans technologue. Après chaque session, l'instructeur et le technologue en simulation (s'il était présent) ont fourni des données quantitatives et qualitatives sur la charge cognitive associée à la simulation.

Résultats : Les instructeurs ont évalué leur charge cognitive de façon similaire indépendamment de la présence du technologue en simulation. Cependant, la composition de leur charge cognitive était différente. Les instructeurs ont subi une moindre charge cognitive liée au simulateur et aux ressources techniques en présence des technologues. La rétroaction qualitative des instructeurs a suggéré des conséquences réelles liées aux différences de charges cognitives concernant (1) les complexités perçues en exécutant le scénario, et (2) les observations des apprenants.

Conclusion : Nous fournissons des données probantes suggérant que les technologues en simulation puissent éliminer une partie de la charge extrinsèque liée au simulateur et aux ressources techniques, ce qui permet à l'instructeur de se concentrer davantage sur l'observation de l'apprenant et d'adapter le scénario à leurs actions.

Introduction

Facilitating simulation is a complex task. Instructors often consider simulation sessions in three components: (1) pre-brief and briefing where learners are oriented, objectives are discussed, and a safe climate is established (2) conducting the actual scenario often requiring the manipulation of mannequins and confederates, and (3) debriefing where learner reflection is often facilitated by instructor observation, commentary and video replay.[1] Running the scenario can be a particularly demanding task as instructors often have to divide their time between several different tasks (1) directing the flow of the scenario, (2) providing input to the mannequin and confederates, (3) observing the performance of the learner, (4) keeping track of time and objectives. In addition, preparing for various simulation sessions requires a large amount of set-up, and takedown. The turnover associated with this can create additional stress on the instructor. This demand on instructors has led to increasing use of simulation technologists during scenarios to assist in some of these tasks. However, the impact of simulation technologists during scenarios on the educational value of the simulation has not been well studied.

Cognitive load theory is a unique lens to view the demands on instructors when running a scenario.[2,3] The fundamental assumption is that a finite amount of working memory is available to be divided into task-specific cognitive effort (intrinsic load), task-irrelevant cognitive effort (extraneous load) and residual working memory capacity, which potentially can be devoted to reflection-in-action for learning (germane load).[4,5] While cognitive load was conceived as means of explaining the impact of instructional design decisions on learning, its principles are equally applicable to other performance based cognitive tasks, such as facilitating simulation. The primary goal, and therefore the intrinsic load of running a scenario, is to facilitate the learner meeting the learning objectives. This usually requires careful observation and attention of the learner, making modifications to the simulation to respond to their actions or inactions, redirecting it to the learning objectives as well keeping track of discussion points for debriefing. The technologic interface needed to manipulate the mannequin, troubleshoot difficulties or coordinate with the confederates could be viewed

as an extraneous load to this primary goal. Familiarity with the equipment, confederates, scenario and environment can help modulate the degree of extraneous load these components of the simulation impose on the instructor.

Managing some component of this extraneous load through support of the simulation by technologists is appealing for several reasons. First, performance on monitoring tasks, like learner observation, are effortful and decay quickly over time, or with competing tasks. Removing some competing tasks from instructors may free more working memory room to devote to learner observation. Second, responding to learner action or inaction often requires a direct response by the mannequin or confederate (e.g., worsening oxygen saturations when supplemental oxygen is not provided) but also judgment about whether the scenario needs to be redirected (e.g., by having a passerby suggest intubation as a next step) so the learner can achieve the intended learning objectives. This judgment requires reflection-in-action by the instructor, a cognitively taxing process. Again, use of simulation technologists to free up instructor cognitive load may result in better learner achievement of learning objectives. Finally, learner feedback is often facilitated using formative assessment scales during scenarios (e.g. the Mayo teamwork scale).[6] These scales frequently rely on tallying observable behaviors to help learners focus on their performance of particular non-technical skills. The significant cognitive load involved in keeping track of multiple observable behaviors, especially in multiple domains, has been documented.[7,8] Instructors with fewer cognitive demands would have more cognitive load to devote to formative assessment.

While the addition of a simulation technologist can assist in all of the above functions, it adds an additional extraneous cognitive load on the instructor in coordinating a response. The instructor must now communicate with the simulation technologist, and coordinate responsibility for tasks during the scenario. This added cognitive load might be greater when the simulation technologist is not from healthcare background. According to a study published in 2015, close to 50% of simulation technologists working at various simulation centres are from non-healthcare backgrounds.[9] The added cognitive load must be balanced against the reduction in cognitive load afforded by having the simulation technologist run the equipment.

The goal of this study was to describe the cognitive load of instructors and its sources and to quantify the effect simulation technologists co-facilitating a session have on the cognitive load of instructors. Importantly, simulation technologists add to the human resource cost of running simulations. In financially constrained environments without technologists, many instructors report challenges in simultaneously running a scenario and observing subtleties to support debriefing of learners. Therefore, determining whether technologists affect instructor cognitive load and observation capacity has important practical implications.

Research question 1: What are the sources of cognitive load among instructors and technologists running high fidelity simulation?

Research question 2: What is the impact of simulation technologists co-facilitating sessions on the cognitive load of instructors?

Methods

Study setting

The study took place within a longitudinal high-fidelity simulation curriculum in emergency medicine for postgraduate residents. Each year, there are twenty-four sessions, half for second year residents and half for fourth year residents. Learners participate in two cases each session. Four or five learners attend each session.

Scenario content for the second year residents focused on developing skills as a team leader and working through ambiguous patient presentations. Cases included a wide variety of content areas, such as trauma, all types of shock, pediatrics emergencies, and obstetrical emergencies. Content for fourth year residents focused on management skills of complex presentations, rare diseases, and difficult encounters. For example, one session is a two-patient trauma scenario. One of the patients requires a surgical airway while the other patient is loud and agitated due to hypoglycemia. Scenario topics are outlined in Table 1

Table 1 – Scenario topics

Location	Learner Level	Topic	Technologist present
Simulation center	4th year	Multi-Patient Trauma	YES
Hospital	2nd year	Vital signs absent	NO
Hospital	2nd year	Abdominal aortic aneurysm Adrenal crisis	NO
Simulation center	4th year	Multi-Patient Trauma Obstetrical Trauma	YES
Simulation center	4th year	Obstetrical resuscitation Neonatal resuscitation	YES
Hospital	2nd year	Trauma	NO
Simulation center	2nd year	Trauma	YES
Simulation center	4th year	Pediatric scenarios	YES
Hospital	2nd year	Altered level of consciousness Toxic alcohol ingestion	NO
Hospital	4th year	Neurologic emergency Endocrine emergency	NO
Hospital	2nd year	Ectopic pregnancy Burn victim	NO
Simulation center	2nd year	Pediatric crisis Neonatal resuscitation	YES
Hospital	4th year	Toxicology scenarios	NO
Simulation center	2nd year	Laryngospasm Massive pulmonary embolism	YES
Hospital	4th year	Respirology scenarios	NO
Simulation center	4th year	Multi-Patient Trauma	YES
Simulation center	2nd year	Vital signs absent	YES
Simulation center	4th year	Multi-Patient Trauma Obstetrical Trauma	YES
Simulation center	2nd year	Trauma	YES
Simulation center	4th year	Pediatric crisis	YES
Simulation center	2nd year	Pediatric crisis Neonatal resuscitation	YES
Simulation center	4th year	Obstetrical crisis Neonatal resuscitation	YES
Simulation center	2nd year	Ectopic pregnancy Burn victim	YES
Simulation center	4th year	Cardiology scenarios	YES
Simulation center	2nd year	Laryngospasm Massive pulmonary embolism	YES

Before this study, instructors did not have access to simulation technologists for these sessions. Our Centre provided simulation technologist support on a trial basis for complex scenarios in order to study their impact on instructors. When technologists were not present, instructors were required to setup and takedown all equipment. We surveyed instructors and simulation technologists about their cognitive load and sources of cognitive load when conducting scenarios.

All instructors and simulation technologists were familiar with and had used the high fidelity equipment for more than two years. The three simulation technologists involved all came from a healthcare background with more than four years of experience in healthcare simulation. The sixteen simulation instructors who participated in the study all had facilitated simulation previously.

Recruitment and consent

We recruited all instructors and simulation technologists via email. All learners were asked a question on their routine anonymous feedback form about whether the data could be used for study purposes.

Data sources

After each session, the instructor and simulation technologist (if present) completed a survey on the cognitive load of the simulation. Both quantitative and qualitative data were collected on the sources of cognitive load. Several faculty facilitators and all technologists were surveyed more than once.

Quantitative data included measurements of the overall cognitive load of running the scenario and the cognitive load attributed to different components (similar to the approach of Leppink[10]) using subjective rating scales.[11,12] Components of the simulation contributing to cognitive load were identified through surveying three simulation technologists and two simulation instructors, followed by a focus group with the respondents to clarify and refine the categories. The sources of cognitive load identified through this process included: the learner, simulator(s), technical resources, confederate(s), fellow instructor(s) or technologist, scenario material. The questions took the format of "When running the scenario, how much mental effort did you have to devote to each?" with a sliding bar from "Did not think about it at all (1)" through to "Had to think so hard my brain hurt (7)".

Qualitative data included answers to these five questions:

- What made the scenario complex?
- Did you encounter any specific challenges or concerns with the scenario (e.g., fire alarm going off, view of learner blocked, concerns about the equipment getting damaged, etc.)?
- Did you redirect or modify the scenario on the fly? If so, how?
- What was the most important observation you made of the learner?
- What would you change about the scenario for next time?

We based the questions on the thematic analysis of a focus group involving two simulation instructors and three simulation technologists, whom we asked about cognitive load running scenarios and its potential impact.

Analysis

For the first research question, descriptive statistics (mean and standard deviation) were used to describe cognitive load among instructors and technologists for the sessions where both were present. Cognitive load of instructors was compared with that of technologists using Mann-Whitney U tests for non-parametric ordinal data[13] (SPSS version 21, IBM). In order to maintain an overall type I error rate of 0.05, Bonferroni correction for multiple comparisons was applied.[14] For the second research question, the cognitive load of instructors was compared when technologists were and were not present using Mann-Whitney U tests for non-parametric ordinal data with Bonferroni correction for multiple comparisons.

We planned a sample size of 36 sessions, which gave an 80% power to detect a 20% difference between groups (http://powerandsamplesize.com) as previous literature has identified performance variation associated with cognitive load differences of 20-25%[15,16].

Three independent researchers (MS, KC and BW) each analyzed the qualitative survey responses for each of the five questions using thematic analysis by. Each researcher independently reviewed the responses and identified 2-3 key themes via inductive coding using a realist paradigm, comparing across different groups.[17,18] Themes were iteratively reviewed and distilled into the written report, allowing consensus to emerge.

The Hamilton Integrated Research Ethics Board provided ethics approval.

Results

Data were collected from 56 simulation sessions each facilitated by one of the 16 different instructors. The instructors delivered the simulation sessions without a technologist present in 14 of the 56 sessions. Simulation technologists provided feedback for 20 of the 42 sessions when they assisted.

Instructor cognitive load compared to simulation technologists

The overall rated cognitive load of instructors and simulation technologists was similar (Table 2), however, instructors perceived the sources of cognitive load differently than technologists. Instructors perceived less cognitive load related to the simulator, technical resources, confederate, and scenario material (all mean differences greater than -1.11, $p<0.05$). The instructors perceived similar cognitive load related to learners and scenario complexity as technologists (p not significant).

Instructor cognitive load with and without simulation technologists:

Instructors rated their cognitive load similarly regardless of whether simulation technologists were present (Table 1). However, the composition of their cognitive load differed. Instructors experienced less cognitive load related to the simulator and technical resources (mean differences -1.73± 0.48 and -1.82± 0.51 respectively, both $p<0.01$) when simulation technologists were present.

Thematic analysis

Salient thematic differences emerged in instructor responses to the 5 post simulation questions, based on whether or not a technologist was present, described below.

What made the scenario complex? When technologists were not present, instructors commented on the complexities of the medical content of the scenario, particularly around

Table 2 - Cognitive load of instructors and technologists

	Instructor without technologist present	Instructor with technologist present	Technologist	P value comparing instructors with and without a technologist	P value comparing instructors to technologists
How much mental effort did you need to devote to running the scenario?	4.43 ± 1.70	3.69 ± 1.52	4.40 ± 1.34	0.56	0.72
How much mental effort did you need to devote to each of the following:					
The learner	4.69 ± 0.48	4.85 ± 0.84	4.78 ± 1.17	0.24	1.0
The simulator(s)	4.73 ± 1.01	3.00 ± 1.50	4.56 ± 1.55	**0.008**	**0.02**
The technical resources	4.70 ± 1.16	2.88 ± 1.49	4.20 ± 1.27	**0.008**	**0.02**
The confederate(s)	3.63 ± 0.74	3.39 ± 1.39	4.50 ± 1.36	1.0	**0.05**
Fellow instructor(s) or technologist	3.20 ± 1.03	3.34 ± 1.38	4.29 ± 1.53	1.0	0.24
The scenario material	2.75 ± 1.06	3.31 ± 1.58	4.72 ± 1.07	1.0	**0.03**
Rate the scenario complexity	3.57 ± 1.34	4.50 ± 1.38	4.55 ± 1.23	0.30	1.0

recognizing severe illness states or important management steps.

"The team had to recognize the toxidrome (which required some prompting from the confederate due to mannequin limitations) and then recognize the associated dysrhythmias. This meant changing vitals frequently on the mannequin in addition to speaking on behalf of an awake patient while also trying to ensure the confederate nurse was following appropriate cues." —Instructor

When technologists were present, both instructors and technologists commented on the challenges of observing and responding to learners (especially when multiple learners were present), communicating with each other and the confederates, and controlling the flow of the scenario when unanticipated action or inaction occurred.

"It's almost impossible to be able to listen to all things you need to at the same time. Let alone respond appropriately without missing something along the way" —Technologist

"There were a lot of bodies in the room, so it was quite challenging to hear and to coordinate all the pieces... I essentially served as the 'coordinator' while the other two instructors each observed one of the patients." —Instructor

Did you encounter specific challenges? When instructors managed simulations without technologists, they described technical issues in more than two thirds of cases including programming malfunctions, mannequin malfunctions, and managing unanticipated leaner actions that required technical intervention during the scenario.

"Despite having pre-programmed the case for the session, the SimPad was running a different case. I had to stop part way through and try re-loading to make sure that I had selected the right case. It seems it was a glitch with the SimPad. It kept running the wrong case, which meant lots of on the fly adjustment of vital signs. This made it much harder to observe the learner actions." —Instructor

In contrast, when technologists were present, challenges cited by both technologists and instructors related to obstructed view of the learners, noise level in the room, and coordinating with confederates.

"View of learner blocked, difficult to hear learner voices as multiple learners speaking at the same time, noise from the compressor, IV pump alarm, and multiple faculty speaking in control room" – Technologist

Did you redirect the scenario on the fly? Without technologists, instructors described five instances of

redirecting for technical reasons (e.g. mannequin lost a pulse but was not supposed to) and one redirection because of learner actions. When technologists were present, instructors describe redirecting scenarios only for unanticipated learner actions or inaction. Technologists described one behind-the-scenes adaptation for a mannequin not working and multiple modifications to help learners realize an incorrect action.

"Decreased sats (oxygen saturations) on fly, as the sensor on mannequin indicated bagging rate was ineffective, feedback provided to resident via confederate about rate, resident increased bagging rate and sats resolved." —Technologist

What was the most important observation you made of the learner? Observation comments were exclusively related to global impressions (largely around team coordination, organization and leadership) when technologists were not present, with only one specific observation moment noted.

"The team was extremely calm and coordinated. The team leader, in particular, was extremely clear in the management of the case and shared her logic clearly with the team." —Instructor

In contrast, when technologists were present, over half of the observations related to specific medical content or observations.

"The team leader developed fixation error around the hypotensive trauma patient. Without help from his team, he was unable to identify other possible causes of hypotension." —Instructor

Technologists commented on learner ability to 'suspend disbelief', notice simulated cues, and the perception of a learner being overwhelmed.

"They did NOT suspend reality. There were a couple times where they did not complete a task because they weren't sure they could perform it on the mannequin without causing harm." —Technologist

What would you change about the scenario for next time? When technologists were not present, instructors considered 'dry-runs' and reprogramming.

"I would make sure the programming is running well!" —Instructor

When technologists were present, instructors commented on improving realism, advanced planning to manage issues with confederates, and adapting the scenario to meet the learning objectives more effectively.

"I would ensure that the confederate nurse was better prepared to emphasize the CHF and crackles. I would also make sure that the patient's voice was portrayed as awake but confused rather than as grunting and barely responding. It also may be worth changing the case to make it clearer the patient is in thyroid storm. This presentation was a rare one - perhaps a more "common" version of this already rare presentation would lead to better accomplishing the scenario objectives." —Instructor

Technologists discussed changing the scenarios to reduce complexity as well as optimizing sound quality.

Discussion

Cognitive load theory provides a unique perspective in understanding the challenge of running high fidelity simulations. Both instructors and simulation technologists have multiple competing demands on their attention while running a scenario. This study provides insight with both quantitative and qualitative data on these varied demands. Instructors and technologists perceived similar cognitive load related to running a simulation. Sources of this cognitive load included the learner, simulator, technical aspects of the simulation, confederate, fellow instructor or technologist and the scenario material itself.

Simulation technologists affected the types of cognitive demands instructors faced. When technologists were present, the instructor's cognitive load related to the simulator and technical resources were reduced. This is consistent with our hypothesis that simulation technologists can manage some of the extraneous cognitive load related to the equipment. Qualitative feedback from instructors suggested real consequences to these differences in cognitive load in (1) perceived complexities in running the scenario, and (2) observations of learners. When technologists were not present, instructors frequently described specific technical challenges (equipment, programming and mannequin malfunctions), and focused observations on global

team function. In contrast, when technologists were present, the instructors described challenges related to observing and coordinating rather than running the scenario; and described more often content-based, specific observations of learners. Whether or not these differences translate into enhanced learner value or behavioral change remains to be established. Nevertheless, the data presented in this study add to the argument that the presence of technologists favorably affected the quality of instructor observation. This finding may help justify the additional cost of technologists.

Interestingly, we uncovered differences between technologists and instructors in sources of cognitive load. Technologists perceived greater cognitive load related to confederates, fellow instructors and scenario material than instructors. This increased load was present even when compared to instructors running scenarios solo without technologists. We do not think this relates to familiarity with the simulation environment or experience-running simulations, as all the technologists in this study were likely to have run far more scenarios than the instructors did. However, instructors may have a more intuitive feel of the scenario content domain, and different relationships with confederates and fellow instructors by virtue of their greater experience in clinical contexts. In contrast, technologists are not necessarily content experts, therefore may need to devote more mental effort to the scenario material. Alternatively, instructors may place less emphasis on these components of the simulation. The impact of these findings is unclear, and may benefit from further study.

This study has several strengths including its mixed method approach, and sampling of different levels of learners. However, there are several important limitations to consider in interpreting our findings. First, the allocation of technologists was not randomized. Technologists were more frequently used in more complex scenarios, such as concomitant management of multiple patients, multiple confederates and multiple learners. This would tend to understate the differences between instructor cognitive load with and without technologists. Replication of these findings in a randomized study will be important to verifying their magnitude and importance. Second, our instructors were very experienced and many were involved in writing the scenarios. This experience and familiarity might mitigate some of the cognitive load experienced in running a simulation without a technologist, further reducing the differences we identified. Third, the sample involved a limited number of instructors and technologists. Fourth, while the scenario content varied widely, it all related to postgraduate emergency medicine training. While it is unlikely that the differences in cognitive load found in this study are context specific, replication in other clinical settings would be important. Finally, the measure of cognitive load involved a standard Paas scale, but used novel anchors “Did not think about it at all (1)” and “Had to think so hard my brain hurt (7)” which had not been formally validated.

Conclusion

Cognitive load theory provides insight into the complexities of running simulation. We provide evidence that simulation technologists can remove some of the extraneous load related to the simulator and technical resources for the instructor, allowing the instructor to focus more on observing the learner(s) and tailoring the scenario to their actions.

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Brief Reports

Medical education reform: a catalyst for strengthening the health system. *Are we ready, Canada?*

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Medical specialist education in Canada is transitioning from a time-based model to a competency-based one, called Competence by Design (CBD).[1,2] The Royal College of Physicians and Surgeons of Canada (Royal College) launched CBD in July 2017, with the fundamental aim of aligning physician competencies with societal health needs.[1-3] The term health systems is defined by the World Health Organizations (WHO) as "*all organizations, people and actions whose primary intent is to promote, restore or maintain health.*"[4] Accordingly, medical education can be conceptualized as part of the health system, and CBD seen as a health system intervention. Given the dynamic nature of health systems, with multiple complex relationships between subsystems, an intervention seemingly limited to one element often has system-wide implications.[5] Viewing CBD implementation through a systems lens can help develop parallel interventions and inform policy and management direction. By taking advantage of interconnected subsystems within the health system it is possible to mitigate unintended consequences while simultaneously identifying areas that can be strengthened.[5,6]

The following analysis applies CBD implementation as a case study, using the World Health Organization (WHO) Health System Framework for Action to illustrate potential implications and related opportunities of medical health education reform for health system functions, from my perspective.[4] Frenk et al. (2009) provide a comprehensive overview of the transformational capacity of health care professional education reform on health systems.[6] They offer an adaptation of the Health System Framework for use in conceptualizing the education system.[6] In 2014, the Royal College published an in-depth report of recommendations for the reform of postgraduate medical education in Canada, going beyond curriculum to consider several aspects of the overall system.[2]

I hope to offer a unique reflective analysis of a specific reform feature in educating specialist medical doctors (referred to as residents), early in implementation and with a health systems perspective. The focus is on selected immediate and mid-term consequences of CBD in Canada. Not all health system implications or opportunities will be covered, nor will the education of general practitioners, who are overseen by a separate

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college.[7] Given the close interactions between elements, some Building Blocks of the Framework will be discussed together, while discussions of Governance will be interspersed throughout.

Competence by Design: Health system lens

Health financing *Most* residents in outcome-based programs like CBD are expected to progress to independent practice earlier.[8,9] Paradoxically, given that CBD is projected to better detect competency deficiencies, some learners may have a longer duration of training than in the current model.[9,10] Regardless of the net effect, the length of time spent as a learner will not be as well-defined as before. Additionally, with an emphasis on diverse learning settings, CBD may result in greater movement of residents between hospitals, clinics, and even provinces.[2] Annual variation has potential budgeting implications for faculties, hospitals, and ministries of health — all of which currently finance aspects of postgraduate medical education.[2,7] This variation will make it necessary to seriously consider how best to adapt current financing models and resident salary negotiation procedures. This may include pooling funds among disciplines or academic centres, and greater coordination among stakeholders. Ultimately, CBD implementation brings opportunities to strengthen financing structures by reducing fragmentation and duplication and increasing transparency.[2,7]

CBD requires direct resident supervision and the formation of competence committees, which will be responsible for assessing eligibility to progress.[11] Currently, there is significant variation among incentive and remuneration schemes for clinicians involved in teaching or serving on committees. Alongside CBD implementation, residency programs must deliberate as to whether committee members will be remunerated. As a result, calls to standardize teacher remuneration and incentives across the province or country may arise, particularly since a greater number of sites not affiliated with a university may supervise resident physicians. In the current economic climate, remuneration may be scaled back, which could have an effect on the supply of clinician teachers.

Health workforce and service delivery Canadian academic hospitals rely heavily on specialist residents to staff clinics, operating rooms, medical wards, and overnight shifts.[2,7] With a shorter duration of residency and more off-site rotations, academic hospitals may experience doctor shortages and a negative effect on patient care. If tasks now carried out by residents are shifted to attending physicians (such as in-house call shifts), some physicians may leave the academic setting. The additional direct supervision and workplace assessment requirements of CBD may have a similar consequence. With medical schools appropriately emphasizing the societal need for generalists rather than specialists, it is both anticipated and desired that fewer students will choose a specialist career.[3] These effects could synergize with CBD implementation, creating doctor shortages and service delivery and clinical teaching impacts across academic health sciences centres.

One approach to both adapt to this potential consequence and strengthen the underlying processes is to design a more coordinated health human resource (HHR) management strategy across different strata — academic institutions, regionally, provincially and at the inter-professional level.[12] Improved coordination can help resolve the current imbalanced proportions of medical school graduates to residency entrance spots; specialists to employment opportunities; specialists to generalists; and urban to rural physicians. As Maudsley et al. (2014) insightfully highlighted, if academic health science centres remain the principal regulator of the number of specialists trained, without regional or national coordination, the needs of academic institutions will continue to take priority.[12] They additionally offered, “we need to move away from the notion that students and residents have an inalienable right to practise in the specialty and scope of their choosing without regard to societal need.”[12] Although restrictions on resident positions have evolved since then, Maudsley et al. illuminate the importance of considering diverse perspectives in a balanced manner during regulatory decision-making. A coherent strategy would also better coordinate the human resource management (and training) of physicians with international medical

graduates, nurse practitioners, registered nurses, physician assistants, and midwives.[2,7] Such cohesion has great potential for ultimately positively affecting the health of individuals, communities, and populations.

Strengthening HHR management processes is difficult to put into operation. Several stakeholders are involved and students' preferences cannot be entirely disregarded. The Royal College has emphasized HHR coordination in several submissions to the Federal Advisory Panel on Health Innovation and the House of Commons Standing Committee on Health.[13] Perhaps coordination and strategic planning can begin within current structures, rather than being deferred until the government creates a new and separate agency.

Information and technology Ideally, CBD implementation will be monitored closely and evaluated in real time. Choosing indicators to determine its impact and developing the capacity for measurement will prove challenging. Thus, opportunities to strengthen monitoring and interpretation of learner outcomes will be plentiful, as well as the links to patient and population outcomes. The Royal College already works closely with organizations such as the Canadian Institutes of Health Information to collect and analyze important data related to specialists. CBD implementation will push the frontiers of harmonization; for example, by streamlining the creation of "Health Intelligence Units"[14] — a type of agency not yet in existence, but proposed as being charged with the surveillance and analysis of the health of a population and its corresponding human resources.[14]

Governance and leadership It is clear that CBD implementation has several implications for governance and leadership. As explored above, this includes impacts on medical education financing models, HHR management, and the alignment of data collection and analysis. CBD implementation will test current structures, and likely propel adaptation. Organizations such as the Royal College may find they are taking on leadership roles and encouraging better coordination without being given a specific mandate or designation from the government. Through innovation, assertiveness, grassroots collaboration, and removal of duplication, CBD implementation can act as a catalyst for visionary leaders to create a stronger health system.

Limitations and next steps

The effects of CBD implementation across all specialty programs in Canada are not yet known. This brief analysis is informed by a health systems conceptual framework, stakeholder perspectives, and a limited amount of experience; but primarily represents my opinions as the sole author. Such limitations are expected because of time lag and the nature of opinion-based analysis, but also reveal the importance of sophisticated evaluation, intentional consultations, and reflection on learning throughout CBD rollout. Many academic centres have experience with competency-based medical education, both internationally and within Canada due to staggered implementation. The orthopedic surgery residency program at the University of Toronto, for example, transitioned to a competency-based model in 2009, and have shared their learning beyond the direct impacts of curriculum.[10,15] The College of Family Physicians of Canada began implementation of a competency-based curriculum in 2011.[16,17] Reflections on learning from this diverse group, in particular regarding any experience with strengthening health systems functions, are invaluable for Canadian decision-makers and front-line clinicians alike. There are still questions regarding how to ensure widespread participation in the generation of such knowledge and its systematic dissemination and application throughout CBD rollout.

Some may view a health system lens as not necessary for CBD implementation, given it is relatively less complex than some other outlooks when considering the full spectrum of health system interventions.[5] The comprehensiveness of this analysis counters that perspective, as using the Health System Framework systematically exposes interactions between subsystems.[3,5] Perhaps the value in applying a health systems lens, then, is not to attempt to predict the outcomes of CBD implementation with a high degree of accuracy; but rather, to build capacity in analyzing systems-wide impacts of an intervention. Such capacity can in turn

be used to unearth opportunities for strengthening health systems functions.

Going beyond identifying the system-wide implications and possibilities accompanying CBD implementation will prove essential. Next steps include consensus-based priority-setting and feasibility assessment by stakeholders, including community partners. Not every opportunity can or should be acted on, but each merits serious reflection. Given the broad scope of opportunities explored, several distinct but cohesive stakeholder deliberations should be considered. Specific representatives may be invited from: faculties of medicine, postgraduate medical education, regional public health authorities, registered nurse associations, ministries of health, hospital associations, patient advocacy groups, community organizations, the Royal College, the College of Family Physicians of Canada, and the Canadian Institutes of Health Information.

Conclusions

Medical education reform in Canada is long overdue to ensure that physicians' competencies will continue to adapt to the evolving health needs of society. This period of transition to a competency-based model provides a unique opportunity for parallel changes to strengthen the related health system processes.

Viewing CBD implementation through a health system lens has allowed for a systematic examination of its implications for Health System functions and relationships. I explored opportunities for strengthening the system, including restructuring the financing of medical education, designing a coherent HHR management strategy, standardizing teaching incentive schemes across geographical regions, and improving capacity for data collection and analysis. Given that stronger governance leads to greater efficiency and a more responsive system as a whole, it is not surprising that the majority of opportunities are closely linked with governance processes.

Since all reforms share the objective of improvement, we must not inadvertently create restrictions of scope. The commitment and coordination of a number of agencies is required to act on the potential that CBD brings. Using a Health Systems Framework at multiple stages of implementation will help. Returning to the question, Are we ready?, the answer is simple: we must become ready. It is time for action.

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Canadian Medical Education Journal

Brief Report

Supporting early academic family medicine careers with the clinician scholar enhanced-skills program

Soutenir les carrières universitaires précoces en médecine familiale par le programme de compétences avancées Clinicien érudit

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Abstract

Context: The Clinician Scholar Program (CSP) is an enhanced-skills (R3) residency program to train clinician researchers/educators/leaders for academic family practice. This article intends to share Laval University's CSP development and evaluation strategy, and provide recommendations for similar innovations in other disciplines/settings.

Methods: This article uses Kern's model to present the program development, and a program-oriented approach for program evaluation, carried from 2011 to 2017 using descriptive data. Questionnaires, reflexive texts and an Objective Structured Teaching Exam supported data collection.

Results: Seven CSP graduates and 14 controls participated in the program evaluation. Residents were highly satisfied with the program, nevertheless they suggested to allow physicians to come back for training later in career. The CSP enriched knowledge, skills and attitudes about academic practice. CSP increased residents' entrustment level about academic competencies. All graduates joined an academic practice within five years of program completion.

Conclusion: Key recommendations to implement similar programs include academic medicine core training, project-based learning with learner-centered objectives, relevant and authentic learning and assessment, and multi-level program evaluation approach. Programs should consider concomitant graduate studies and opportunity to offer such training after a few years of clinical practice to meet other needs at a timely stage of career.

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Résumé

Contexte: Le programme clinicien érudit (PCÉ) est un programme de résidence de compétences avancées (R3) destiné à former des cliniciens chercheurs / éducateurs / leaders en vue d'une pratique de médecine familiale universitaire. Cet article a pour but de faire connaître la stratégie de développement et d'évaluation du PCÉ de l'Université Laval et de formuler des recommandations pour des innovations similaires dans d'autres disciplines/contextes.

Méthodes: Cet article utilise le modèle de Kern pour présenter le développement du programme et une approche d'évaluation orientée sur le programme, réalisée de 2011 à 2017 à l'aide de données descriptives. Des questionnaires, des textes réflexifs et un examen d'enseignement objectif structuré ont permis de recueillir des données.

Résultats: Sept diplômés du PCÉ et 14 témoins ont participé à l'évaluation du programme. Les résidents étaient très satisfaits du programme, suggérant néanmoins de permettre une formation plus tard dans la carrière. Le PCÉ a enrichi les connaissances, les habiletés et les attitudes relatives à la pratique universitaire. Le PCÉ a augmenté le niveau de confiance des résidents en ce qui concerne les compétences académiques. Tous les diplômés se sont engagés dans une pratique universitaire dans les cinq années suivant leur graduation du programme.

Conclusions: Les principales recommandations pour la mise en œuvre de programmes similaires incluent la réalisation d'un tronc commun en médecine universitaire, l'apprentissage par projet avec des objectifs centrés sur l'apprenant, des stratégies d'apprentissage et d'évaluation pertinentes et authentiques, et une approche d'évaluation de programme à plusieurs niveaux. Les programmes doivent envisager offrir des études supérieures en parallèle et la possibilité d'offrir cette formation après quelques années de pratique clinique afin de répondre à d'autres besoins à un stade opportun de leur carrière.

Introduction

Since the beginning of 21st century, academic family medicine has been facing various challenges, such as adjusting to new clinical demands in academic health centers, organizing and administering new initiatives in community-based education, developing and maintaining research capacity, and serving multiple missions (education, clinical care, and academic pursuits) in times of financial restraint.[1] Training and recruiting academic physicians is a major challenge, particularly early on in their career.[2] The literature describes many research, education, and leadership training programs for early-career clinicians.[3, 4] However, few target residents or focus on more than one of these academic missions.

Increasing capacity in many Canadian family medicine residency programs in recent years has resulted in the hiring of a pool of clinician teachers, acting mainly as role models without necessarily having other graduate degrees besides the medical diploma. As in United States,[5, 6] family medicine programs are facing the challenge of training a new wave of physicians with an interest in academia.

Since 2009, the College of Family Physicians of Canada (CFPC) has been encouraging medical schools to offer a Clinician Scholar Program (CSP) as an enhanced-skills (supplemental year) program. Currently, most CSPs offered in Canada are research-oriented and offered in English. Université Laval's CSP is intended to train clinician researchers, educators and leaders in clinical and academic francophone settings, promoting scholarship[7] in all three academic missions.

As proposed by Thompson,[5] this article intends to share our CSP development and first five years' program evaluation strategy and provide recommendations for similar academic fellowship in other settings.

Methods

Program development and overview

The CSP aims to train competent faculty who are aware of the importance of scholarship as a way to

enhance their institution's national and international outreach, as well as their own. Residents involved in this program mostly complete it as a full-time PGY3, but may also spread it over PGY2 and PGY3 during completion of their second year of family medicine residency training. The CSP curriculum starts with a core Academic Medicine rotation where all residents are trained around academic practice requirements, strategies, and its expected scholarship. An elective in clinical research, medical education or academic management/leadership then allows them to enhance their skills in a one of these academic missions, and clinical activities are spread over the rest of the year (Table 1), to provide residents with a clinical and academic schedule similar to the one they will manage in their future practices.

The Family medicine and emergency medicine department chair and the family medicine program director at Laval University initially approached the future CSP program director (who had recently completed the Academic Fellowship program at the Department of Family and Community Medicine, University of Toronto) to discuss local needs around training for academic practice. Needs assessment included discussions with local faculty, analysis of the CFPC standards for the new CSP programs, and a literature review. The program therefore built on similar existing programs.[2,5,6] This article uses Kern's steps to present the program development[8] (Figure 1).

Presentation of the program to medical students at Laval University "Salon des programmes de residences", program website (http://www.fmed.ulaval.ca/programmes-detudes/etudes-en-medecine/residences-etudes-medicales-postdoctorales/residence-en-clinicien-erudit/presentation/) and targeted solicitation by site directors facilitated resident recruitment.

Most faculty for the CSP had already completed graduate studies in research, medical education or management/leadership programs. The others were already involved as faculty development workshops facilitators. At the beginning of each academic year, personalized training around metasupervision is provided by the program direction to the preceptors in teaching units attended by CSP residents in the medical education track .

Program evaluation. Program evaluation was carried out from 2011 to 2017 using descriptive data based on a program-oriented approach.[9] Kirkpatrick's classification of training outcomes[10] structured the data collection. Although program evaluation activities do not fall within the scope of research ethics board review at our institution[1], we respected voluntary participation (not mandatory for promotion), informed consent and confidentiality in data management and reporting results.

Reaction. We assessed reactions to the program activities using a feedback questionnaire at program completion, providing a satisfaction score (product of relevance (/5) x met expectations (/3)) and assessing general satisfaction and workload. Since the Medical and Academic Leadership/Management elective was particularly innovative, we analyzed the strengths and avenues for improvement of this rotation with a preceptor survey.

Learning. We assessed learning using a retrospective pre-post self-evaluation questionnaire.[11] Self-assessment scales regarding achievement of program evaluation objectives drew on Bloom's (knowledge),[12, 13] Simpson's (skills),[14] and Krathwohl's (attitudes)[15] taxonomies. We also asked each resident to identify three take-home messages from the program.

Behaviour. We assessed the impact of the CSP on resident behaviour also using a retrospective pre-post self-evaluation questionnaire,[11] as well as content analysis of reflective texts written by residents upon completing the program, applying a framework for analysis relating to the three academic missions.

Finally, we assessed the impact of the Medical Education track on residents' teaching behaviours using Objective Structured Teaching Exams (OSTE) held at the outset and the end of the program, each learner being paired with another resident of

[1] As stated in the 2014 edition of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (http://www.pre.ethics.gc.ca/eng/policy-politique/initiatives/tcps2-eptc2/chapter2-chapitre2/): "*Quality assurance and quality improvement studies, program evaluation activities, and performance reviews, or testing within normal educational requirements when used exclusively for assessment, management or improvement purposes, do not constitute research for the purposes of this Policy, and do not fall within the scope of REB review.*"

equivalent level of training demonstrating a similar interest in education (control). The examination used Morrison et al.'s teaching scenarios,[16] translated and adapted with permission. The assessment grid was adapted from the CFPC's fundamental teaching activities framework.[17]

Results. The "results" component of this program evaluation compares the scholarship of CSP graduates with other new clinical faculty who joined our department between 2011 and 2015 (control group), and their intention to practice in an academic setting five years of graduation. We assessed the factors influencing this intention with a social cognitive theory-based questionnaire.[18]

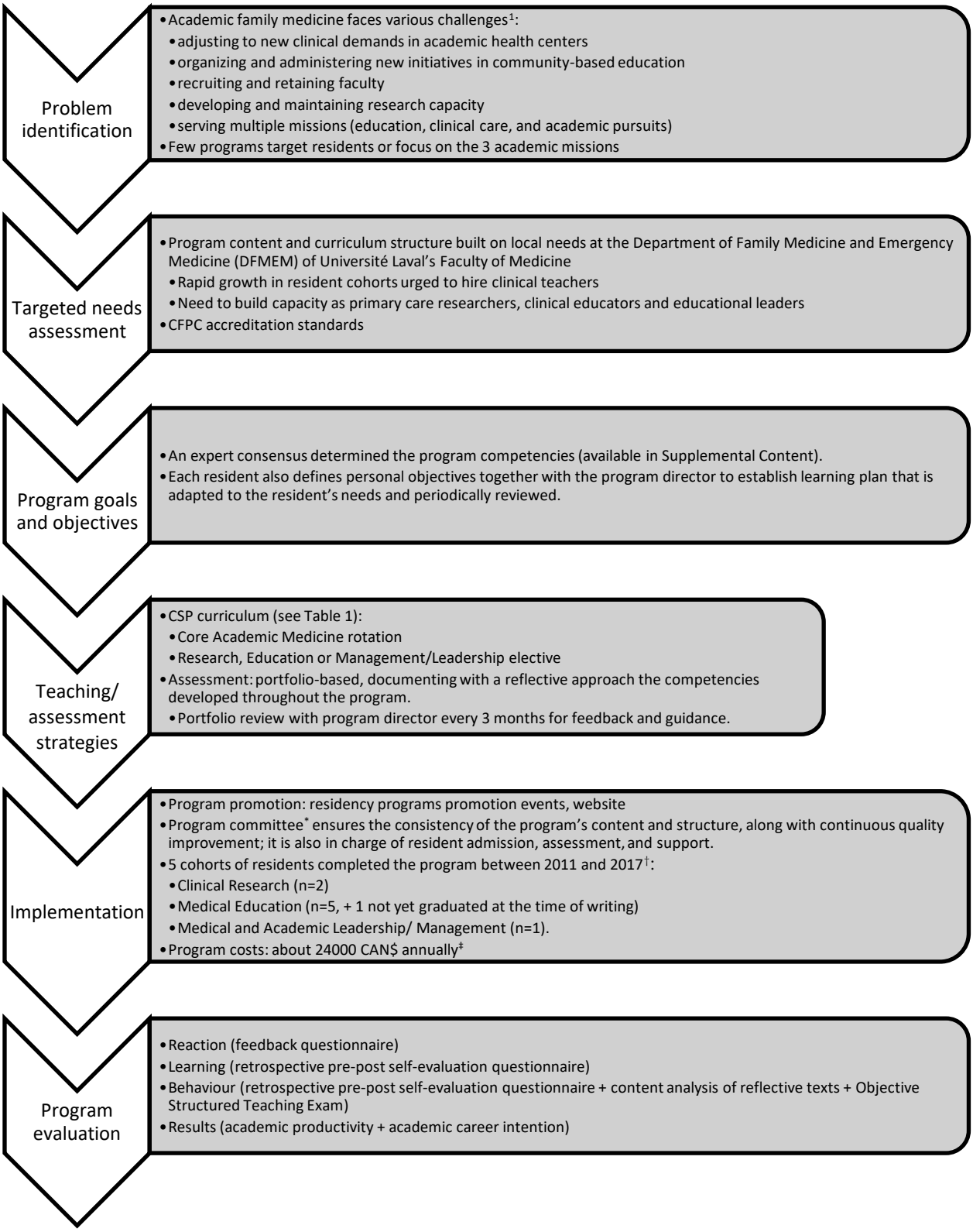
Table 1. Université Laval's clinician scholar program curriculum

Track			Teaching activities	Duration	Description	Teaching strategies		
Research	Education	Leadership/ Management				**In-class learning**	**Practicum**	**Research/ Innovation project**
x	x	x	**Academic medicine rotation** NOTE: This rotation also welcomes up to 8 residents from other CFPC or RCPSC residency programs to help build a community of practice and optimize resources.	12 weeks block (first 3 months of training)	12-week long pillar for the development of a range of basic research, teaching and leadership skills. Inspired mostly from humanist and socio-constructivist learning theories, this rotation promotes learners' intrinsic motivation and responsibility for learning through a project-based approach that promotes scholarship and experiential learning, fostering learning through the creation of a community of practice.	28 three-hour long workshops focusing on each step of a scholarly project as well as on some medical education and leadership/ management skills (estimated faculty time around 80 hours, since some workshops involve more than one faculty)	Three hours of clinical supervision accompanied by a role model (estimated faculty time: 3h)	Drafting of project proposal (estimated faculty time for project supervision: 3h)
x	x	x	**Family medicine rotation**	12 weeks, horizontal	Enables residents to maintain 120 half-days of clinical practice spread over the entire year of training.		Family medicine clinical activities spread across the duration of the program (2-3 half-days/week). (estimated faculty time: around 30 minutes per half-day for overhead supervision)	
x			**Clinical research elective**	28 weeks, horizontal	28-week long elective, involving: • graduate-level courses • longitudinal practicum, where they are also encouraged (with financial support) to visit other medical schools as "academic tourists" to	Two master's degree courses in clinical epidemiology or other relevant disciplines (already available to epidemiology students in other programs, so no		Clinical research project (estimated faculty time: 50h)

					broaden their understanding of academic medicine. • research/innovation project to be presented in a local or national conference by the end of their training	extra time commitment for faculty)		
	x		**Medical education elective**	28 weeks, horizontal		Master's degree-level courses (Medical Education – Principles and Practices - estimated faculty time: 54h) and faculty development workshops (already available to all clinical teachers, so no extra time commitment for faculty)	Undergraduate teaching Clinical supervision (clerks and residents) Faculty development and/or continuing professional development Metasupervision by senior clinical teachers (estimated faculty time: 50h)	Needs assessment, curriculum development, program evaluation, etc. (estimated faculty time: 50h)
		x	**Medical and Academic Leadership/ Management elective**	28 weeks, horizontal		Two master's degree courses in administration (already available to students in administration, so no extra time commitment for faculty)		Development, implementation and/or evaluation of a leadership/ management project (estimated faculty time: 50h)
x	x	x	Clinical scholar program lunches	8 one-hour meetings	Monthly encounters to enhance the skills developed during the Academic Medicine rotation while providing opportunities for networking with faculty.	Monthly discussion meetings on academic medicine-related topics. Before each meeting, participants do the suggested readings. During the activity, discussions on the topic takes place with invited faculty members (estimated faculty time: 8h)		

CFPC: College of Family Physicians of Canada; RCPSC: Royal College of Physicians and Surgeons of Canada

Figure 1. Program development (adapted from Kern's steps of curriculum development[8])



* *Program committee is composed of the program director, of each track leader (research, education and management/leadership) and of one or two residents.*

† *Governmental restriction of 2 trainees/year)*

‡ *Includes the time of faculty (program committee members) and staff (3 staff members, the same as for the Family medicine residency program) directly involved in program management as well as material costs, but not the time commitment of faculty (teaching in the CSP is part of their academic duties) nor opportunity costs.*

Results

Five to seven CSP of the 7 graduates (71-100%) and 14 of the 20 new clinical faculty who joined our department between 2011 and 2015 (control group, 70% response rate) took part in the program evaluation (variable number of participants for each type of evaluation). One third of graduates and 20% of the control group held graduate degrees in addition to their medical degree.

Reactions to the program

The general satisfaction with the program was high (4.7±0.5/5). The workload was appraised as demanding to very demanding (4.3±0.5/5). The most appreciated activity was the Academic Medicine intensive workshops (score 14.3/15, n=7). All graduates would recommend the program to colleagues interested in academic practice.

Program evaluation specific to the Medical and Academic Leadership/Management elective has highlighted the various levels of practicum exposure (*clinical*: local/regional/provincial; *academic*: teaching site/program/department/faculty level), as well as the resident project spinoffs for the teaching site. Suggested improvements included focusing on some activities and choosing a limited number of supervisors to enhance educational continuity, dispersion across activities and supervisors, better defining resident and supervisor roles and responsibilities, and allowing later enrollment into the program, i.e. after at least 2-5 years of clinical practice including experience in leadership/management.

Learning

The learning self-assessment reflects higher-level objective achievement in the cognitive, psychomotor, and affective domains at the end of the program (Table 2). The residents' take-home messages highlighted their learning in relation to scholarship, including the importance of rigor and impact of academic work (n=7), critical thinking (n=2), clinical-academic work balance (n=2), career planning (n=2), and leadership (n=2). A number of residents also mentioned educational strategies (n=2) and approaches to educational innovation (n=1), self-directed learning (n=1) and networking (n=1).

Behaviour

The perceived entrustment level for various academic competencies progressed throughout the program. In addition, content analysis of the reflexive texts written by residents (n=6) at program completion highlights the development/improvement of a number of behaviours associated with practice in the three academic domains (Table 2): graduates value the scholarship approach, understand their teaching role for which they use a range of strategies, and are confident about taking on academic responsibilities making use of their management skills and with the help of the network they have developed during their training year. More particularly, residents taking the Medical Education elective demonstrated an improvement of their OSTE score by 14.4% compared to the control group residents (6.6%).

Results

Intention to practice in an academic setting five years of graduation was similar between graduates (4.8±0,45/5) and controls (4.9±0.36/5). Despite small sample size, available research/leadership opportunities, academic workload and seeking professional-personal life balance seem to influence CSP graduates' intention to practice in an academic setting five years after graduation, whereas the possibility to practice in a large urban center, reduced clinical exposure and available teaching opportunities seem to have more influence on other new clinical faculty. (Figure 2 – Supplemental digital content).

CSP graduates' academic productivity seemed relatively comparable to that of the control group. However, CSP graduates had slightly more opportunities for national outreach (Table 3 – Supplemental digital content). All CSP graduates joined an academic practice within five years of program completion (4 within and 3 outside the Laval University network).

Table 2. Université Laval's Clinician Scholar Program impact on learning and behaviour (self-assessment)

		Pre-program Mean(SD)	Post-program Mean(SD)
Learning	**Knowledge (according to Bloom's taxonomy[12, 13])** (n=7) 0 – I have no knowledge of this concept 1 – I am able to **define** it 2 – I **understand** the principles associated with it 3 – I am able to **apply** this concept's principles in my academic practice 4 – I am able to use this concept to **analyze** scholarly works 5 – I am able to **synthesize** the information relating to this concept and to teach it 6 – I am able to use this concept to **evaluate** my own work and the work of others		
	Conceptual frameworks in research, education, and management	0.0 (0.0)	4.3 (1.2)
	Scholarly project	1.0 (0.8)	4.3 (1.3)
	Curriculum development	0.4 (0.5)	4.3 (1.3)
	Information technologies in academic practice	1.6 (1.0)	4.4 (0.5)
	Skills (according to Simpson's taxonomy[14]) (n=7) 0 – I have no understanding of this skill 1 – I am able to **identify** the situations where this skill is required 2 – I am **preparing** for practicing these skills 3 – I demonstrate this skill when guided (**close supervision**) 4 – I need assistance in complex situations or to validate my practice (**distant supervision**) 5 – I adapt my practice of this skill according to context (**independent practice**) 6 – I am **creating** new ways to practice this skill		
	Patient assessment through a learner case review	2.4 (1.3)	4.6 (0.5)
	Communication skills	3.9 (1.9)	4.7 (0.5)
	Teaching strategies	1.4 (1.0)	4.7 (0.8)
	Critical reading skills	2.7 (1.5)	4.4 (0.5)
	Personal management skills	3.3 (1.7)	5.0 (0.6)
	Interpersonal management skills/teamwork	3.6 (1.8)	4.9 (0.9)
	Attitudes (according to Krathwohl's taxonomy[15]) (n=7) 0 – I am not entirely open to this approach 1 – I am **open** to this approach 2 – I am able to **contribute** to discussions on the topic 3 – I am able to **criticize** this approach 4 – I am able to **express my opinion** on this approach 5 – I am **demonstrating** the principles of this approach in my practice		
	Scholarship (working with rigour, getting peer assessment of one's work, and disseminating it)	1.4 (1.6)	4.6 (0.8)
	Self-directed learning (identifying one's training needs/objectives, implementing relevant strategies/resources, self-evaluation of learning)	2.4 (1.9)	4.6 (0.5)
	Critical thinking	1.7 (1.1)	4.4 (0.5)
	Ethics of academic practice	1.7 (1.5)	4.3 (1.0)

		Pre-program Mean(SD)	Post-program Mean(SD)
Behaviours	**Behaviours** (n=7) 0 – Non applicable 1 – I need **close supervision** 2 – I need **distant supervision**, i.e. occasional assistance to validate my actions or to get help in complex situations 3 – I am **independent**: I felt ready to practice on my own using this competency 4 – I feel like a **mentor** : I am able to teach this skill and provide guidance to others		
	Assessing and taking charge of complex clinical situations	2.0 (1.3)	2.7 (1.4)
	Discussing the importance of the three academic domains, i.e. research, education, and management, and the interconnection between them	1.2 (0.8)	3.2 (0.4)
	Defining a research question	1.3 (0.8)	2.8 (0.4)
	Reviewing the literature relevant to the topic	1.3 (1.0)	3.2 (0.8)
	Planning methodology	1.2 (1.0)	2.3 (0.5)
	Determining the schedule for a project	1.2 (0.8)	3.5 (0.5)
	Managing project implementation	1.0 (0.6)	3.2 (0.4)
	Building a database	1.3 (1.0)	2.8 (0.4)
	Analyzing project results	1.5 (1.0)	2.5 (0.5)
	Carrying out small-group teaching	1.3 (1.0)	3.2 (1.0)
	Lecturing	1.2 (0.8)	2.8 (0.8)
	Writing a scientific article	1.2 (0.8)	2.7 (0.8)
	Preparing and presenting a poster	1.0 (0.0)	3.2 (0.8)
	Collaborating with colleagues in research, education, AND leadership/management positions	1.2 (0.8)	2.8 (1.5)
	Supervising students/residents	0.8 (0.8)	2.8 (1.5)
	Personal management skills (clinical, academic, and personal activities)	2.3 (0.8)	3.3 (0.5)
	Exercising leadership skills	0.8 (0.4)	2.0 (1.2)
	Exercising modalities of influence in management (power, authority, leadership, politics)	0.7 (0.5)	1.5 (1.4)
	Implementing a reflective approach in relation to my academic practice (portfolio)	1.0 (0.0)	3.0 (0.9)
	Planning academic career	1.2 (0.4)	3.2 (0.8)
	Content analysis of behaviours reported in the reflective texts written by residents (n=6) at the end of the program, for the 3 academic missions: Research • Working in a scholarly manner (n=4) Education • Using a range of clinical teaching strategies (n=3) • Using a range of small group teaching strategies (n=3) • Communicating effectively (n=2) • Acting as a resource for colleagues in a clinical teaching context (n=1) • Identifying one's limits in the context of teaching (n=2) Leadership/management • Demonstrating personal (n=3) and interpersonal (n=2) management skills • Developing collaboration and networking (n=1) • Pursuing an academic career (n=4) • Taking on academic responsibilities early in career (n=3)		

Discussion

The CSP at Université Laval offers a francophone training environment for a new wave of academic family physicians working towards a scholarship perspective. It is one of the rare programs targeting basic skills development in the entire range of academic medicine missions. Some schools have developed similar programs, but we found only two who have published their program description and/or evaluation. The first, from the Department of Family Medicine of the University of Western Ontario (London, ON, Canada) aimed "to produce academic family physicians who exhibit […] outstanding clinical skills, professional interest in the organization and transmission of knowledge, and a scholarly approach through research and skills of leadership.[19] However, this program did not involve residents, but faculty members. Outcomes from this program included changes from private practice and lecturer to positions as assistant/associate/full professor and chairman/director, taking positions of responsibility for teaching and administering educational schemes. Graduates also produced substantial scholarly contributions. The other program we could find was the O'Connor Stanford Leaders in Education Residency program (Stanford University School of Medicine, California, USA) focuses mostly on teaching and scholarly projects, with leadership training components. This program increased confidence in teaching skills, and increased scholarly work output.[20] While we noticed an interest in the CSP during residency program promotion events or information requests, more specific data about impact on applicants to our family medicine residency program would be helpful.

The reactions to the program are strongly positive, particularly for the academic medicine rotation. This is probably related not only with its content (principles of scholarship being new for many residents) and structure (project-based learning), but also by residents' discovery of and involvement in a new community of academic practice. In general, our program resulted in learning, behaviours, and results that are comparable to those obtained in related programs, with similar challenges.[3, 6, 21-25] Despite the absence of obvious impact of the CSP on the factors influencing intention for academic practice, it succeeds in providing tools supporting early academic career.

This program development and evaluation has certain limitations. To date, the CSP has mostly attracted applicants for the Medical Education track. The Clinical Research track might be more attractive if combined with a master's degree, therefore facilitating a clinician-researcher career for graduates. Furthermore, the limited number of applicants for the Medical and Academic Leadership/Management track suggests that interest in and need for this type of training emerges later in one's career. We are currently considering the possibility of offering this training after a few years of clinical practice in addition to the current third year residency enhanced-skills program. Other limitations result from political pressure to take on unattached patients in Quebec since 2014[26,27] (with a growing number of family physicians focusing on clinical practice to the detriment of their academic involvement), which undeniably affected the program's recruitment capacity and might explain decreased academic productivity following the program. Finally, the small size of the contingent of residents we can enroll and the choice we made of choosing an outcomes-based evaluation strategy do limit the conclusions we can draw from the program evaluation. Assessment of other aspects than outcomes (ex.: context, input, process[28]) would also be relevant for program directions. Nevertheless, our program evaluation strategy provided some qualitative data reinforcing that we meet the training needs of the new generation of family medicine faculty.

Université Laval's CSP is a unique francophone residency program supporting new family physicians in an early academic career, balancing their clinical and academic roles with confidence in an environment fostering scholarship, mentorship, and networking. Program structure and content appears easily transferable to other specialties. We are confident that other medical schools should succeed in implementing similar programs in their own setting, to prepare the next generation of academic medical faculty. Key recommendations to implement similar programs (Box 1) include academic medicine core training, project-based learning with learner-centered objectives, relevant and authentic learning and assessment, and multi-level program evaluation approach. To meet other needs at a timely stage of career, programs should consider concomitant

graduate studies and offering such training after a few years of clinical practice.

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Appendix A

Box 1 – Key recommendations for development, implementation and program assessment of an academic medicine program

Based on the program evaluation results and consequent reflective analysis by the program committee members, further academic medicine programs should:

Consider academic medicine core training at the program outset, to ensure strong bases for all residents, networking and engagement in their new community of practice.

Focus on learner-centered objectives, using project-based learning to foster intrinsic motivation for learning.

Engage residents in "real life": help them manage clinical, academic and personal life schedules, using a horizontal curriculum; use relevant and authentic assessment strategies, having them build their teaching dossier as a portfolio documenting their competency achievement through the program.

Encourage residents to pursue graduate studies concomitantly with their third-year clinical scholar residency program.

Consider offering an academic leadership program after a few years of clinical practice, since interest in and need for training as an academic leader seems to emerge later in career.

Adopt a multi-level program evaluation approach to foster scholarship in this field and provide evidence-based support for further program development. Assessment of other aspects than outcomes (such as context, input or process) would also be relevant for program directions.

Appendix B

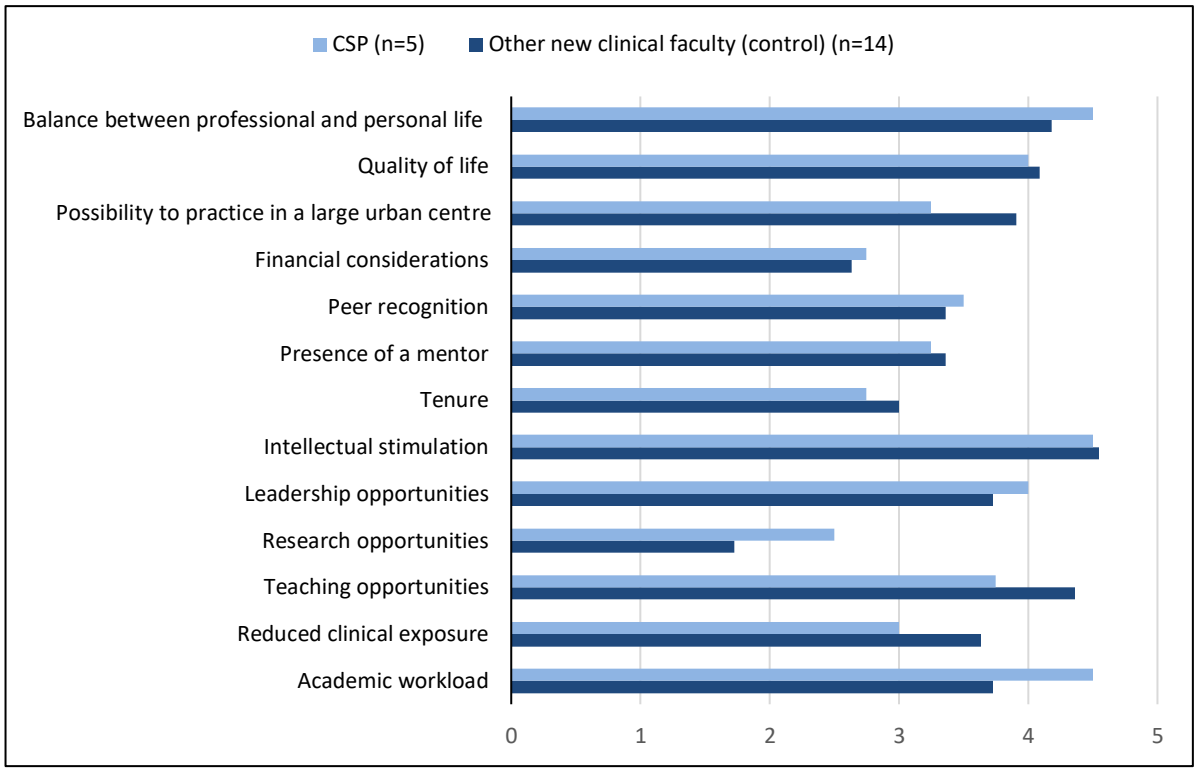
Table 3 - Academic productivity among CSP graduates and other new clinical faculty who joined the Department of Family Medicine and Emergency Medicine between 2011 and 2015

Scholarship demonstrated by CSP graduates and other new clinical faculty		
	CSP (n=5)	New clinical faculty (control group) (n=14)
Teaching (%)		
• Classroom – pre-graduate	60%	43%
• Classroom – post-graduate (residency)		
• Clinical training / supervision	80%	86%
• Learner assessment (certification examinations)		
• Teaching innovations	80%	100%
	10%	7%
	80%	86%
Research (mean(SD))		
• Number of projects as principal investigator	2.1 (1.5)	0.1 (0.3)
• Number of projects as collaborator		
• Number of funded projects	0	0.2 (0.4)
	0.4 (0.3)	0
Leadership & administration (%)		
• Academic	60%	64%
• Clinical		
• Politics	20%	57%
	0%	7%
Dissemination (mean(SD))		
• Peer-reviewed journal publications (first author)	0.3 (0.4)	0
• Communications (international)		
• Communications (national)	0	0
- Papers (oral presentations)		
- Posters		
- Workshops		
	0	0
	0.8 (0.8)	0.2 (0.4)
	0.8 (1.1)	0.2 (0.3)

CSP : Clinician Scholar Program

Appendix C

Figure 2 – Factors influencing the intention to practice in an academic setting five years after graduation



Factors influencing the intention to maintain an academic practice five years after graduation assessed using a questionnaire based on three social cognitive theories: ***theory of reasoned action***[29]*,* ***theory of planned behaviour***[30] *and* ***interpersonal behaviour theory***[31]*. CSP: clinician scholar program graduates.*

Competencies associated with the CanMEDS scholar and leader/manager roles included in Université Laval's Clinician Scholar Program (Quebec City, Canada)

The competencies to be developed within the program were identified by a consensus of experts (program committee and teaching advisor) based on the College of Family Physicians of Canada (CFPC) accreditation standards for Clinician Scholar Programs, the literature on academic medicine competencies[a-e], always embedded in the CanMEDs-family medicine framework[f]. The competencies related to clinical work with patients remained the same as those required under the family medicine residency program, since the CSP is aimed at maintaining acquired skills while developing greater independence for practice.

Program track			**Competency**	**Entrustment levels** (The numbers in parentheses indicate program expectations (in months) when each level must be achieved)		
Research	Education	Leadership		**Close supervision**	**Distant supervision**	**Independent**
			SCHOLAR			
x	x	x	Working from a scholarship perspective	Does not work from a scholarship perspective	Develops scholarly projects in a rigorous manner and requests from peers to review his or her work (8)	Submits his or her work for dissemination at the national or international level (13)
x	x	x	Building practice on recognized conceptual frameworks (theories, models, and best practices)	Builds research/education/ leadership strategies that include a limited number of conceptual frameworks	Builds research/education/ leadership strategies that include some conceptual frameworks that were suggested to him or her (3)	Builds research/education/ leadership strategies after having identified and analyzed the relevant conceptual frameworks (11)
x	x	x	Identifying the scientific literature that is relevant to his or her work using the appropriate databases	Needs close supervision from a mentor to conduct a literature search	Identifies the relevant literature using customary databases in his or her field (5)	Acts as a mentor to guide his or her colleagues in their literature search and directs them to more specialized sources when needed (11)
x			Providing constructive criticism of colleagues' academic work	Comments mainly on the strengths and refers to a few points for improvement in a cursory manner	Provides balanced comments of strengths and points for improvement (8)	Provides constructive comments of strengths and points for improvement, supported by references, and offers relevant rectifications (13)
	x		Adopting a clinical "coaching" approach in his or her daily supervision activities *	Mostly validates the clinical conduct of the learner. Acts intuitively or understands and applies some recognized educational principles in relation to clinical supervision. Maintains at times a supervisor-trainee hierarchy.	Teaches various CanMEDS-FM competencies along with validating clinical conduct. Analyzes educational principles and identifies those that are most relevant to use depending on the clinical supervision situation, and encourages a "learning position" (11)	Acts as a leader** and scholar in relation to clinical supervision (14)
	x		Adopting a competency "coaching" approach throughout the learner's training *	Acts intuitively or applies some recognized educational principles in relation to feedback and mentorship. Maintains at times a supervisor-trainee hierarchy.	Refers to a set of educational principles and identifies those that are most relevant to use depending on the feedback and/or mentorship situation, and encourages a "learning position" (11)	Acts as a leader** and scholar in relation to feedback and mentorship (14)
	x		Developing a training curriculum outside the clinical setting *	Acts intuitively when planning the curriculum.	Refers to a set of educational principles and applies those that are	Demonstrates leadership** and scholarship in curriculum

					most relevant to his or her training activity outside the clinical setting (8)	development (including program assessment) (13)
x	x	x	Applying a range of **teaching strategies** in his or her training activities	Teaches intuitively and prefers lecturing to other educational strategies.	Includes some interactive strategies in his or her teaching (1)	Includes a variety of teaching strategies, encouraging collaborative learning in most training activities (3)
	x		Adapting the program to the needs of **learners with difficulties** *	Acts intuitively or understands and applies some recognized educational principles to support learners with difficulties	Analyzes educational principles and identifies those that are most relevant to the learning plan of a learner with difficulties (11)	Demonstrates leadership** and scholarship to support learners with difficulties (14)
x	x	x	Documenting his or her learning process in a **portfolio**	Has an incomplete or poorly structured portfolio.	Documents his or her activity planning and academic production in a thorough and structured fashion (3)	Documents the acquired skills through feedback documents and reflective texts (8)
			LEADER			
x	x	x	Managing his or her time and priorities with a view to reconciling his or her **professional obligations (clinical and academic)** and **personal** life	Has difficulty prioritizing his or her professional obligations when faced with multiple requirements. Devotes too much time or not enough time to personal needs. Solves scheduling conflicts with difficulty or delay, or requires several supervisor interventions in order to ensure his or her practice's effective management	Usually prioritizes appropriately his or her professional obligations when faced with multiple requirements. Is generally able to set adequate time aside for personal needs. Most of the time solves scheduling conflicts and rarely requires supervisor intervention in order to ensure his or her practice's effective management (6)	Prioritizes consistently and appropriately his or her professional obligations when faced with multiple requirements. Consistently sets adequate time aside for personal needs. Solves scheduling conflicts consistently and effectively, and is managing his or her practice productively (12)
x	x	x	Using **information technologies** effectively to ensure his or her academic practice's efficient functioning	Uses basic information technology functionalities (for example, word-processing and presentation software)	Uses appropriate advanced information technology functionalities in his or her academic practice (for example, table of contents, and reference and bibliography management software to cite sources) (3)	Uses advanced and/or interactive information technology functionalities to improve his or her academic practice (for example, bibliography management software for scientific articles database management, and interactive survey to make presentations more dynamic) (13)
x	x	x	Demonstrating **leadership** in the context of his or her scholarly project	Requires close assistance in order to assume the administrative roles related to his or her project. Needs stimulation in order to participate actively in working meetings	Is sometimes slow to assume the administrative tasks related to his or her project. Participates actively in working meetings (5)	Anticipates and assumes the administrative tasks related to his or her project in a timely manner. Demonstrates leadership in the context of working meetings (11)
		x	Implementing **change** in his or her setting	Requires close supervision to implement changes in his or her practice, requiring assistance for specialized aspects. Reacts to challenges/difficulties.	Needs distant supervision to implement changes in his or her practice and applies recognized theoretical principles in management. Anticipates challenges/difficulties. (11)	Acts as a mentor with his or her peers and supports them in the implementation of change in their practice. Evaluates his or her interventions on the basis of recognized theoretical principles in management (13)
		x	Experimenting with a range of **leadership** styles in	Exercises leadership spontaneously without knowledge of leadership styles	Consciously experiments a number of leadership styles in his or her interventions (8)	Adjusts his or her leadership style to the situation (11)

			order to advance his or her projects			
		x	Exercising a range of **management skills**	Exercises some management skills in a spontaneous and intuitive manner	Exercises a number of management skills in a conscious manner (11)	Acts as a mentor with his or her peers when exercising management skills (14)
x	x	x	**Soliciting** the relevant university and healthcare system authorities for the purpose of his or her projects	Requires close supervision from some relevant authorities for the purpose of his or her projects.	Needs distant supervision from a number of relevant authorities for the purpose of his or her projects. (5)	Acts as a mentor with his or her peers to help them soliciting relevant authorities for the purpose of their projects (14)
x	x	x	Exercising various **modalities of influence** in relation to management (power, authority, leadership, political skill)	Exercises some modalities of influence in his or her management activities in a spontaneous and intuitive manner	Consciously experiments with a number of modalities of influence in his or her management activities (8)	Adjusts his or her modalities of influence to the management activity concerned (11)

* Fundamental teaching activities framework[5]. In order to meet the entrustment level requirements for clinician scholars in the early stages of their career, residents must fulfill all requirements of the "Consistently applies fundamental and advanced educational tasks" level of the CFPC standards.

** Leadership means that the teacher is considered as a resource person or a mentor by his or her peers.

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Canadian Medical Education Journal

Brief Reports

Status of global health fellowship training in the United States and Canada

Situation des Formations complémentaires en santé mondiale aux États-Unis et au Canada

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Abstract

Background: Increasing numbers of residency graduates desire global health (GH) fellowship training. However, the full extent of training options is not clear.

Objective: To identify clinical GH fellowships in all specialties in the U.S. and Canada and to describe their demographics, innovative features, and challenges.

Methods: The authors surveyed program directors or designees from GH fellowships with a web-based tool in 2017.

Results: The authors identified 85 programs. Fifty-four programs (63.5%) responded confirming 50 fellowships. One-third of fellowships accepted graduates from more than one specialty, and the most common single-specialty programs were Emergency Medicine and Family Medicine. Fellowships most commonly were 24 months in duration with a median size of one fellow per year. Funding and lack of qualified applicants were significant challenges. Most programs were funded through fellow billing for patient care or other self-support.

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Conclusion: The number of U.S. and Canadian GH fellowship programs has nearly doubled since 2010. Challenges include lack of funding and qualified applicants. Further work is needed to understand how best to identify and disseminate fellowship best practices to meet the diverse needs of international partners, fellows, and the patients they serve and to determine if consensus regarding training requirements would be beneficial.

Résumé

Contexte: Un nombre croissant de diplômés des programmes de résidence optent pour une formation complémentaire en santé mondiale. Cependant, la pleine mesure des possibilités de formation n'est pas claire.

Objectif: Identifier les formations cliniques complémentaires en santé mondiale pour toutes les spécialités aux États-Unis et au Canada et décrire leur démographie, leurs caractéristiques novatrices, et leurs défis.

Méthodes: En 2017, les auteurs ont interrogé les directeurs de programmes de formation complémentaire en santé mondiale ou leur représentant à l'aide d'un outil en ligne.

Résultats: Les auteurs ont identifié 85 programmes. 54 programmes (63,5 %) ont répondu et confirmé 50 programmes de formation. Un tiers des programmes acceptaient des diplômés provenant de plusieurs spécialités, et les programmes offerts à des spécialités uniques étaient plus fréquemment ceux en médecine d'urgence et en médecine familiale. Les programmes étaient généralement d'une durée de 24 mois avec une capacité d'accueil d'un moniteur (fellow) par année. Le financement et le manque de candidats qualifiés étaient des défis de taille. La plupart des programmes étaient financés par la rémunération des moniteurs (fellows) pour les soins qu'ils prodiguaient aux patients ou via d'autres aides financières individuelles.

Conclusions: Le nombre de programmes de formation complémentaire en santé mondiale a presque doublé depuis 2010. Les défis sont notamment le manque de financement et de candidats qualifiés. Il est nécessaire de poursuivre le travail pour pouvoir bien identifier et transmettre les meilleures pratiques en matière de formation complémentaire afin de répondre aux divers besoins des partenaires internationaux, des moniteurs (fellows) et des patients qu'ils soignent, et déterminer si un consensus concernant les exigences de formation serait bénéfique.

Introduction

Over the past four decades, interest in global health (GH) among physicians-in-training has increased dramatically.[1–3] GH fellowships – which provide advanced training in GH beyond the clinical requirements of residency – have existed since at least 1997.[4]

As GH medical school electives, residency tracks, and fellowships become more common, it is important that trainees, program directors, international partners, and future employers understand the scope and value of these experiences. The first survey of U.S. GH fellowships documented the growing number and variety of GH fellowship opportunities available in 2010 and described program characteristics such as size, duration, specialty, and educational activities.[5] Subsequently, profiles of individual GH fellowships[6–10] and reviews of GH opportunities within subspecialty fellowships[11–16] have been published. However, no subsequent studies have examined trends across all specialties.

Our objectives with this study were to identify all active U.S. and Canadian GH fellowships in all specialties and to describe their features including innovations, challenges, and graduate activities.

Methods

A GH fellowship was defined as formal medical training beyond the usual requirements and length of residency. Fellowships that followed the completion of an accredited residency program or were integrated within a residency program (but extended its length) were included. Fellowships that were solely research-based were excluded to improve comparability amongst programs.

We identified GH fellowship programs from multiple sources, including 1) the Global Health Fellowship Database (globalhealthfellowships.org);[5] 2) peer-reviewed and gray literatures; 3) epidemiologic

snowball sampling, in which participants identified programs not currently listed in the Global Health Fellowship Database; and 4) web searches. Inclusion criteria were programs which: 1) required an additional training period beyond residency requirements, 2) self-identified as 'global health' or were identified as such by others through snowball recruitment, and 3) included a clinical training component.

We contacted fellowship directors or their programs' listed point of contact using publicly-available information. Study participants completed a web-based survey (Survey Monkey, San Mateo, CA). We reminded non-respondents to complete the survey with email and, if needed, telephone reminders. We collected data from March to July 2017.

An author with expertise in survey design (AP) led the survey development. The survey contained up to 36 (using skip-logic) closed- and open-response questions (Supplementary Materials, Appendix) and was pilot-tested prior to distribution.

This study was reviewed and exempted by institutional review boards of the University of Wisconsin School of Medicine and Public Health, Massachusetts General Hospital, and by the Health Research Ethics Authority of Newfoundland and Labrador.

Results

We identified 85 potential fellowship programs. Fifty-four programs responded (63.5%), of which 50 (92.6%) offered a GH fellowship (Supplementary Materials, Figure s1). Of the four remaining respondents, two had closed their fellowships, one never had a fellowship, and one is intending to start a fellowship. Thirty-one programs did not respond but were considered probable active fellowships based on careful review of their websites. We requested and received permission to use each program's information such as location and contacts in the Global Health Fellowship Database (globalhealthfellowships.org). Our data reflect survey responses from the 50 confirmed fellowships unless otherwise indicated.

Fellowship program characteristics

Table 1 lists program characteristics such as duration, location, and size. The majority of programs were located on the East Coast of the U.S. (Supplementary Materials, Figure s2).

Coursework was primarily completed in resource-rich areas of North America (n=39, 86.7%). Research and policy/advocacy work were primarily done in resource-limited settings in low- and middle-income countries (LMICs) (research: n=42, 91.3%; policy: n=33, 82.5%). Clinical work was commonly performed in resource-rich settings in North America (n=34, 73.9%) and resource-limited settings in both North America (n=24, 52.2%) and in LMICs (n=35, 76.1%) (Supplementary Materials, Table s2).

Table 1: Characteristics of active fellowship programs

Clinical specialty	Number of fellowship programs accepting applicants from clinical specialty (n=50)
Anesthesia	4
Emergency Medicine	23
Family Medicine	22
Internal Medicine	12
Medicine-Pediatrics	6
Obstetrics and gynecology	5
Pediatrics	8
Psychiatry	1
Surgery	3
Other discipline (advanced practice nursing)	2

Length of program	**Number of programs (n=50: 46 programs that follow residency training plus 4 integrated residency-fellowship programs)**		
6 months	1 (2.0%)		
12 months	17 (34.0%)		
24 months	26 (52.0%)		
Other	6 (12.0%)		
Funding source	**Number of programs using funding source (n=47) [a]**		
Fellow self-support [b]	45 (95.7%)		
Department or academic institution funds	32 (68.1%)		
Private foundation	13 (27.7%)		
Graduate medical education or government	8 (18.2%)		
International partner	8 (18.2%)		
Fellowship activities	**Number of programs requiring or offering this activity (n=46)**		
	Mandatory	**Optional**	**Not available**
Clinical work	45 (97.8%)	1 (2.2%)	0
Coursework	38 (82.6%)	8 (17.4%)	0
Research	33 (71.7%)	12 (26.1%)	1 (2.2%)
Policy or advocacy work	12 (28.3%)	32 (69.6%)	1 (2.2%)
Teaching by fellow	40 (87.0%)	6 (13.0%)	0
Partnership organizations	**Number of programs forming this partnership (n=46)[a]**		
Medical schools and residencies in LMICs	36 (78.3%)		
Non-governmental organizations	32 (69.6%)		
Policy-makers/governments	21 (45.7%)		
Industry/private sector	8 (17.4%)		
Indigenous band/tribal councils	7 (15.2%)		
Other	11 (23.9%)		
None	2 (4.3%)		

[a] more than one option could be chosen
[b] self-support includes fellow covering own expenses and/or generating revenue domestically through patient care in clinic, urgent care, hospital, or community health center
Abbreviation: LMICs = low- and middle-income countries

Fellowship program challenges and innovations

Program representatives ranked six challenges (6 = most and 1 = least significant). Mean ranking is presented here. Lack of funding (4.5) and qualified applicants (4.1) were ranked most challenging. Lack of political/institutional support (3.7), experienced GH faculty (3.6), fellowship accreditation (2.6), and international placement sites (2.5) were ranked less challenging.

Respondents could provide free-text responses for other perceived challenges and innovative or important aspects of their programs (Table 2).

Fellowship graduate characteristics

Respondents estimated that from 2012-2016 their programs each graduated a cumulative total of 0-19 graduates (median 2). Thirteen programs (26.0%) had yet to graduate a fellow so were excluded from post-fellowship analyses.

Twenty-six programs tracked their graduates' activities through surveys, interviews, or informal contact. Graduates commonly participated in direct patient care (n=24, 92.3%), education (n=22, 84.6%), and research (n=14, 53.8%). Fewer than half of graduates participated in advocacy, policy development, or administration. Sixteen respondents provided an estimate of the proportion of their graduates working three or more months per year in LMICs (range 0-100%, mean 49.6%).

Comparison of 2010 and 2017 fellowships

In the 2010 survey by Nelson *et al*., 80 programs in the U.S. self-identified as GH fellowships.[5] However, residency track-only programs were not specifically excluded from that study. Because of the substantial differences in depth of training and oversight between a residency track and a fellowship program,[17,18] we required programs to meet a more stringent definition of GH fellowship for our survey. We determined that only 39 U.S. programs in 2010 would have met our study's definition of a GH fellowship, not 80 reported by Nelson *et al*. While Nelson, *et al* did not survey Canadian programs in 2010, three of the Canadian programs (42.9%) identified in our study were founded prior to 2010

.

Table 2 Examples of self-identified challenges, program changes, and important or innovative activities reported by GH fellowship programs

Examples of challenges or program changes	
Funding	● Lack of political support jeopardizes the program
Systems	● Balancing structure with flexibility and customization especially since essentials of GH training have yet to be formalized ● Grant management and timely approval from institutional review boards ● Lack of adequate clinical volume
Applicant recruitment	● Difficulty reaching potential applicants and tailoring to interests ● Increasing number of fellowship positions creates competition ● Lack of credibility of GH training; "why should I do this fellowship?"
Field site	● Changes in political environment (e.g., war, doctors' strike) ● Lack of mutual understanding amongst partners and decision-makers regarding timeline and structure ● Difficulty securing housing in low-resource environments
Examples of innovative or important program features	
Structural	● Multidisciplinary: accept physicians, registered nurses, allied health professionals, PhDs ● Recruitment pairing: recruit one fellow from underserved partner site for every US-trained fellow ● Trans-mentorship model for research: pairs fellows from one discipline with senior investigators from a different discipline; provides fellows with multiple sources of intellectual, practical, and career guidance ● Fellow-driven program: fellows have freedom and funding to develop projects of interest ● Advocacy: write policy documents and opinion pieces ● Patient care opportunities: provide care in North American and international locations such as: o Indigenous, migrant farmworker, or refugee health o Inner-city o Critical access hospital

Education and training	● Specialized training of fellows: ○ GH simulation[40] ○ Faculty development ○ Ultrasound ○ Trauma-informed care ○ Humanitarian aid ○ Language ○ Burn care ○ Dentistry ○ Anesthesia ○ GH delivery ● G-LOCAL experience: combined community medicine/GH fellowship ● Certifications and Master's degree programs ○ Masters in Public Health [traditional and online] ○ Masters in Science ○ Masters in Science in Clinical Investigation ○ Masters in Medical Management ○ Masters in Clinical Epidemiology and Health Services Research ○ International Diploma in Humanitarian Assistance ○ Diploma in Tropical Medicine and Hygiene
Field site	● Supervision: fellows work with the fellowship director in a low-resource setting the majority of the time ● Contributing to host education: ○ Family Medicine residency education in LMICs, including curriculum development ○ Fellows partner with host institution on quality improvement projects and host-country continuing medical education

Discussion

We identified 81 total U.S. and Canadian GH fellowships, and 50 programs across various medical specialties responded to our survey. We found that lack of funding and qualified applicants were the greatest challenges for fellowship programs.

The majority of respondents in our survey (95.7%) report some type of fellow self-support as a means of funding the training program. Although complex, current fellowship billing rules provide an opportunity for sustainable global health education programs that serve domestic or (indirectly) international underserved populations. In the U.S., Accreditation Council for Graduate Medical Education (ACGME)-accredited fellowship programs (e.g., sports medicine, hospice and palliative medicine, and many others) bill for fellow services at a designated fraction of the fee charged for the same service by an attending. These programs also typically receive some funding through the U.S. government and the hospital in which the fellow is based. However, if a residency graduate joins a non-accredited fellowship (e.g., global health), the fee charged for the fellow's service is the same as the attending physician's fee. The fellow's income is typically lower than the attending because fellowship programs use some of the receipts to cover expenses related to education and administration of the fellowship. This self-support funding model may make training programs more attractive to leaders, decision-makers, and communities.[19] Detailed tracking of GH fellowship graduates is needed to understand the long-term outcomes of training and create a compelling argument for a positive return-on-investment for government funding.[20–23]

We estimate the total number of U.S. fellowship programs (according to our definition) grew from 39 in 2010 to 74 in 2017 (increase of 89.7%). This exceeds growth seen in GH training opportunities for medical students and residents.[2,3] Out of 1,063 U.S. family medicine (FM) residents surveyed who were planning fellowship training, only 2.1% intended to apply for FM GH fellowships.[24] Further study is warranted to determine how well fellowship opportunities match the demand for post-residency GH training. This could include subgroup analysis by specialty, region, or format/content of programs so programs struggling with vacancies could learn from subgroups that excel at recruitment.

Despite challenges, respondents described a multitude of fellowship innovations. Programs reported innovative teaching opportunities, advanced training courses, and varied settings for patient care that were consistent with best practices for international partnerships.[25–30] Our study identified many opportunities for growth in the field of GH fellowship training such as improving interprofessional training, building partnerships with tribal councils, honing advocacy skills, and pairing fellows from high-resource and low-resource institutions. In the face of the rapid increase in GH fellowship programs and the common problems of funding and lack of qualified applicants, it is critical to continually reassess and prioritize needs of the international partners to ensure mutual benefit for all participants.

Next steps in the field of GH fellowship training should include discussion amongst U.S. and Canadian program leaders, current and potential international partners, and GH fellows to optimize fellowship structure, funding, and competencies. Preliminary work to define GH competencies at the residency and fellowship level has been published already.[31–36] A demographic survey of fellows and *potential* fellows is needed to inform this work. Understanding factors such as ethnicity, gender, sexuality, and socio-economic background may help educators and partners prioritize competencies and overcome unintended biases that may be influencing their programs.

While our response rate was higher than typical web-based surveys,[37–39] the actual number of fellowships could be larger if our search failed to identify programs, or smaller, if selection bias led to a greater proportion of closed programs among our 31 non-responders.

In addition to the fellow demographic study described above, future studies could characterize non-clinical, research-based programs, alternatives for physicians preparing for a career in GH (e.g., diploma or certificate programs in tropical medicine, public health, or health administration) and why some GH fellowship programs have closed. Further study of funding models and matching of high-quality fellowships sites and fellow candidates would be beneficial. Such global fellowships may want to establish a type of voluntary registry so that the data can be updated regularly and changes monitored more easily.

Conclusion

The number of U.S. and Canadian GH fellowship programs has nearly doubled since 2010. Major challenges include lack of funding and qualified applicants. Further study is needed to assess 1) whether the quickly growing number of GH fellowships may have exceeded applicant demand, 2) how training programs can meet the needs of both international partners and a diverse group of fellows, and 3) how to incorporate and align innovations and best practices in education, research, and advocacy to ensure improved patient outcomes. Although our study did not identify any GH program accredited by the ACGME, fellowship program leaders should consider whether consensus on core competencies and minimum training requirements would be beneficial for fellows, their employers, and patients.

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Appendix A

Figure s1. Flow diagram for identification of global health fellowship programs

Legend: Abbreviations: GH = Global Health

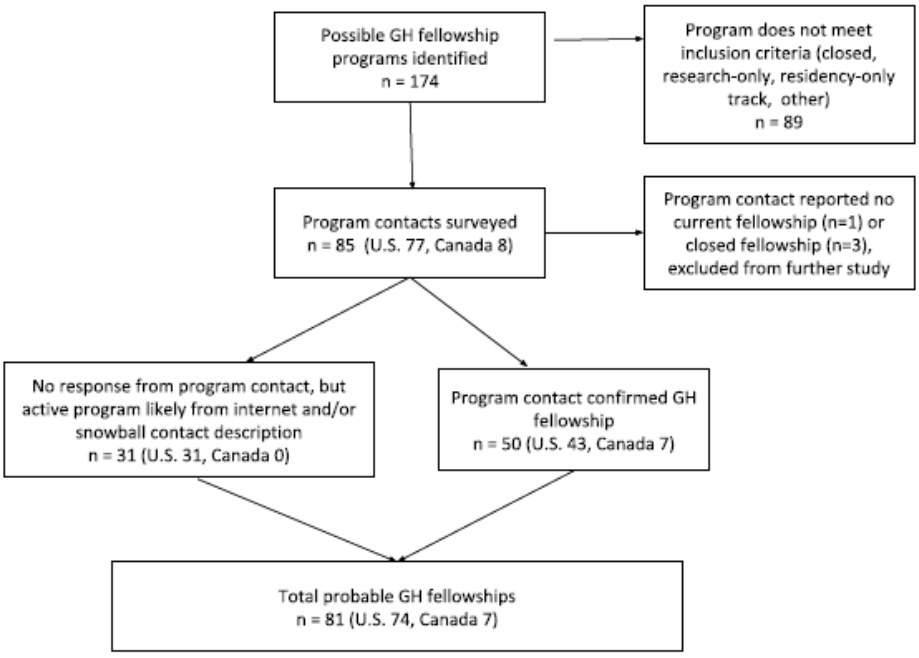

Figure s2. Map of identified GH fellowships in US and Canada, all specialties

Legend: Created using ArcGIS Pro by Environmental Systems Research Institute

Appendix B

Table s1: Number of programs reporting fellowship activities by setting

	Clinical work (n=46)	Teaching (n=46)	Policy/Advocacy (n=40)	Coursework (n=46)	Research (n=46)
Resource-limited, LMIC	35 (76.1%)	42 (91.3%)	33 (82.5%)	7 (15.6%)	42 (91.3%)
Resource-rich, North America	34 (73.9%)	35 (76.1%)	25 (62.5%)	39 (86.7%)	21 (45.7%)
Resource-limited, North America	24 (52.2%)	14 (15.2%)	15 (37.5%)	7 (15.6%)	15 (32.6%)
Resource-rich, LMIC	3 (6.5%)	9 (19.6%)	10 (25.0%)	4 (8.9%)	10 (23.3%)

Abbreviations: LMIC: low- and middle-income countries

Appendix C: Global health fellowship director survey

To better characterize current opportunities for trainees across disciplines, we are conducting this survey of global health fellowship programs available in the US and Canada.
We hope the results will be helpful to programs and trainees and thank you in advance for your participation.

For this survey, "global health fellowship" is defined as formal training principally focused on global health beyond the minimum required length of training for residency. This additional period of training could be either subsequent to or integrated into residency training.

1. Please enter the name of your institution

2. Does your academic department currently offer formal fellowship training in global health?

□ Yes

□ Not at this time (Skip to question 2a)

2a. Which of the following statements best describes your academic department's history with global health fellowships?

□ We had a global health fellowship that has since been terminated (Skip to question 2b)

□ We have plans to begin a global health fellowship within the next two years (Skip to question 3).

□ We have never had a global health fellowship, and have no immediate plans to begin one (Thank-you for completing this survey)

2b. Please explain the circumstances around the closure of your global health fellowship program.

2c. Are you interested in participating in a future study addressing the topic of terminated global health fellowships?

□ Yes (Provide your contact information)

□ No (Thank-you for completing this survey)

3. From which clinical specialty (or specialties) does/will your global health fellowship accept applicants? Check all that apply.

□ Anesthesia

□ Emergency medicine

□ Family medicine

□ Internal medicine

□ Obstetrics and gynecology

□ Pediatrics

□ Surgery (any field)

□ Other (please specify)

4. Is your academic department located in the US or Canada?

□ US □ Canada

5. Please indicate the month and year in which your global health fellowship program was established.

Month: ____

Year: _____

6. When does your global health fellowship occur, relative to your residency program?

□ After residency training is completed (skip to question 6a)

□ Integrated with residency training (skip to question 6b)

□ Both options are available to our applicants (skip to question 6b)

6a. What is the typical length of your global health fellowship?

□ 6 months

□ 12 months

□ 18 months

□ 24 months

□ Other (please specify)

6b. What is the typical length of your global health fellowship (not including months devoted to other parts of residency training)?

□ 6 months

□ 12 months

□ 18 months

□ 24 months

□ Other (please specify)

7. How many global health fellowship positions do you typically offer each year?
8. Please estimate the number of global health fellows who graduated from your program between 2012 and 2016, inclusive? (Please do not include current fellows who have yet to graduate.)
9. What are the eligibility requirements for candidates to participate in your fellowship program? Please check all that apply.

□ Completed medical school

□ Completed residency training

□ Prior global health experience

□ Board eligibility

□ Other (please specify)

10. What criteria are most important in selecting your global health fellows? Please rank your responses from 1 to 6, where 1 = most important and 6 = least important.

□ Written application file (essays, CV, letters of recommendation, etc.)

□ Interview

□ Applicant's previous global health experience

□ Applicant's Masters of Public Health (MPH) or other advanced degree

□ Applicant's intention to pursue global health as a major career focus

□ Applicant's potential for leadership in global health

11. How is your fellowship funded (e.g., to pay for fellows' salary, travel costs, coursework, administrative costs, etc)? Please check all that apply.

☐ Fellow billing for patient care

☐ Fellow self-funding

☐ Department funds

☐ Academic institutional grant

☐ Private foundation

☐ Public grant funding (e.g., NIH or CIHR)

☐ Graduate medical education (GME) or government funding

☐ Funds from international partner

☐ Other (please specify)

The next set of questions focuses on the content of your global health fellowship program.

12. What best describes the role of each of the following activities in your global health fellowship?

	Mandatory	Optional	Not available
Coursework			
Clinical Work			
Research			
Teaching (by fellow)			
Policy/advocacy work			

13. Please describe any novel training/experiences related to any of these activities that are available to your fellows.

14. In which settings do your fellows complete the following activities?

	Resource-limited settings in North America	Resource-rich settings in North America	Resource-limited settings in low-or middle-income countries	Resource-rich settings in low-or middle-income countries
Coursework				
Clinical work				
Research				
Teaching (by fellow)				
Policy/advocacy work				

The next few questions ask about what happens after fellows graduate from your program.

15. Does your program formally follow up with your fellows regarding where they are working after graduation?

☐ Yes

☐ No

☐ Not applicable (e.g., no graduates to date)

16. When following up with fellows, what outcomes are tracked (e.g., career activities and work setting)?

17. How are the outcomes measured (e.g., follow-up survey at 12 months post-graduation)?
18. What global health-related career activities do your fellows typically participate in after they graduate? Please check all that apply.

□ Advocacy

□ Direct patient care

□ Research

□ Policy development

□ Education

□ Administration

□ Other (please specify)

19. In 2016, what proportion (%) of your graduates to date spent at least 3 months of the year working in a low- or middle-income country after graduation?

□ I don't know

Proportion: ____

These last questions provide an opportunity for you to tell us more about your program.

20. With which of the following organizations has your program established a partnership? Please check all that apply.

□ Non-governmental organizations (NGOs)

□ Medical schools/residency programs in low- and middle-income countries

□ Policy-makers or governments

□ Indigenous Band/Tribal Councils

□ Industry/private sector

□ We have not established partnerships with any of these organizations.

□ Other (please specify)

21. What components of your global health fellowship program have you cancelled or significantly changed because they were ineffective?
22. Please rank the following challenges in order of significance to your program, where 1 = most significant and 6 = least significant.

□ Lack of funding

□ Lack of experience global health faculty

□ Lack of political or institutional support

□ Lack of fellowship accreditation

□ Lack of qualified applicants

□ Lack of collaborating internal placement sites

23. Please tell us about other important challenges your program has faced that were not included in the previous question.
24. Please describe any aspects of your program that you consider innovative.

Members of our team have established a public database of global health fellowship programs that aims to provide applicants and other stakeholders a current listing of global health fellowship programs in North America.

25. May we include your global health fellowship in this database, listing your fellowship's program title, city and state/province and website?

☐ Yes

☐ No

26. Please provide your fellowship program's preferred website address.

27. We would like to ensure that we identify all global health fellowships in the U.S. and Canada.

Please list any global health fellowships of which you are aware (existing or in development) that are not already listed on our database. If possible, please include fellowship program title, location, academic institution, and/or any contact information you may have.

28. Thank you again for your willingness to complete this survey. If you have any additional comments or questions, please feel free to include them below.

29. If you would like us to email you a summary of the survey results, please provide your email address in the space provided.

Canadian Medical Education Journal

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Transitioning to competency-based medical education: impact of educational interventions on internal medicine residents' understanding of the purpose and process

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Background/purpose

Postgraduate medical education training in Canada has been in a transition from a purely time-based model to a more competence-based model. The new model places greater emphasis on residents demonstrating competence in the essential skills of their future profession, a model known as Competency-Based Medical Education (CBME), than on time spent in the program. In Canada, Family Medicine residency training was the first to transition implementing the College of Family Physicians of Canada's Triple C Competency Based Curriculum.[1]

More recently, the other 66 specialties have begun their transition to the Royal College of Physicians and Surgeons' Competence By Design[2] (CBD) model in a staged fashion with seven cohorts transitioning between 2017 to 2023. Core Internal Medicine residency training was part of the 2019 cohort, but the program at the University of Alberta transitioned to a CBME model early, with a pilot in July 2016 and launch in July 2017, two years before most other Canadian programs. In July 2018, we made the last changes to meet the Royal College's CBD requirements of adding milestones to our EPA forms. The purpose of this paper is to describe our approach to engaging residents about CBME, to demonstrate the effectiveness of our approach, and to share resources we developed between July 2016 and July 2018 that may help the over 50 other specialties across the country launch in the coming years.

Our approach

In July of 2016 we adapted our Mini-CEX forms to use entrustment language and mapped them to the draft version of the Entrustable Professional Activities (EPAs) available from our specialty committee. We asked residents to attempt one EPA observation per week, but few residents were able to get the requested one EPA per week. There were various reasons offered.

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To address this, we conducted a needs assessment in January 2017 in which we surveyed our residents (56 of 99 responding), asking them to rate their agreement to statements regarding their understanding of the purpose and processes of CBME, and their understanding of EPAs and process to acquire them. Comment boxes were provided for residents to elaborate on any barriers. Our research ethics board approved these data collection procedures as well as a follow-up survey. The results indicated a few areas that needed to be targeted. First, residents did not fully understand what an EPA was and which to get at any given time. Second, residents felt they and their preceptors were unsure of their role in CBME, i.e. who is driving this process. Finally, residents did not understand how CBME was being operationalized, specifically, how individual assessments would be used to sign off EPAs and allow resident progress through stages.

To address these, we took three approaches. First, we created a series of short 5-10-minute online videos explaining the purpose of CBME including the roles of various stakeholders, what a competency-based assessment framework looks like, and approaches to planning which EPAs to get and how to ask preceptors for them. We used some of these videos in a Grand Rounds presentation to help front line preceptors prepare for July 1. The videos are available at the following link: https://tinyurl.com/UofACIMCBMEvideos

Second, we updated our Internal Medicine residents' website with information regarding which rotations are high yield for which EPAs with information presented by EPA, and by rotation. Finally, we created a one to two-page EPA Quick Reference document for each of the four stages of training, so residents could see a high-level overview at a glance of the EPAs for a given stage. Screenshots of our website, the EPA Quick Reference documents, and the Grand Rounds presentation are available here: https://tinyurl.com/UofACIMCBMEresources

Evaluation of initiatives

In fall of 2017, three months into a new academic year, we repeated our previous survey with 68 of 99 residents responding. We had success with improving residents' knowledge of their role in CBME (medium effect size), and their perception of their preceptors' understanding of CBME (medium effect size), but not their preceptor's understanding of their role in CBME (non-significant increase). Residents had a better understanding of what EPAs were (large to very large effect size), and how assessments were used to sign off EPAs (medium to large effect size), but unfortunately, we were unable to improve resident's knowledge of which EPAs to get or identifying good opportunities to get them. See Table 1.

Table 1. Resident responses to pre and post surveys

Scale	Pre-Survey Mean*	Post-Survey Mean*	Pooled SD	Δ p-value	Effect size (Cohen d)
Knowledge of their role	4.89	5.48	1.24	0.012	0.47
Preceptors' understanding of CBME	4.45	5.05	1.20	0.008	0.50
Preceptor's understanding of their role in CBME	4.21	4.57	1.24	0.128	N/A
Understanding of EPAs	4.68	5.92	1.28	<0.001	0.97
How Assessments are used to sign off EPAs	4.66	5.47	1.24	0.001	0.66
Which EPAs to get	4.86	4.65	1.43	0.439	N/A
Having trouble identifying opportunities to get EPAs	5.21	5.05	1.60	0.581	N/A

**1=Strongly Disagree, 4= Unsure, 7=Strongly Agree.*

The comments indicated that the largest barriers were busy clinical services in which residents did not feel they could ask preceptors to take the time to fill out the EPA form, and frequent situations where the residents reviewed with a senior resident/subspecialty fellow and not the attending physician. Another barrier was that our new assessment system (which was adapted from our medical school's locally developed system for our July 2017 launch) did not have a search function, so residents had to know which EPA covered, for example, Breaking Bad News and often selected a few EPAs before finding the correct one.

We asked residents to rate how helpful they found each resource on a Likert scale (1=Not helpful, 2=Slightly, 3=Somewhat, 4=Very, 5=Extremely). Residents found all resources somewhat to very helpful with the videos rated 3.6 (SD 1.0), updates to the website 3.6 (SD 0.8), and the EPA Quick Reference guides 3.7 (SD 0.8).

Since this last survey, we have developed some other videos to help residents and preceptors understand the stages of discipline specific to our specialty, as well as other tips to help streamline the EPA form process. Our videos have been shared with our postgraduate medical education office, which oversees all residency programs at the University of Alberta, and they have begun using the videos to help the other nine programs which have launched CBME in July 2017 and July 2018. As of September 2019, based on the individual view count of the 11 videos we created, there have been 1817 views.

Summary

The resources we have developed have helped our residents' transition to CBME and have begun helping other residency programs locally. There is still work to be done in terms of optimizing our assessment system to meet the needs of residents with features like a search function, and we need other strategies to help faculty understand their role in CBME.

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Canadian Medical Education Journal

You Should Try This!

A student affairs podcast as novel communication tool

Une baladodiffusion sur les affaires étudiantes comme nouvel outil de communication

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Implication Statement

Podcasts are prevalent within medical education, but not within medical student affairs. Our Office of Student Affairs (OSA) created a podcast focusing on topics relevant to the medical student experience. There have been over 20,000 downloads thus far. Survey responses and feedback have been positive and highlight the podcast's utility as a communication tool, with 96% of respondents saying they would recommend this podcast to others. Given the mission of student affairs offices to advise, mentor, and educate students, a student affairs podcast is an exciting innovation for medical schools to consider.

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Déclaration des répercussions

Les baladodiffusions prévalent en éducation médicale, mais pas auprès des organisations soutenant les affaires étudiantes. Notre Bureau des affaires étudiantes (BAE) a créé une baladodiffusion axée sur des sujets pertinents à l'expérience des étudiants en médecine. Il y a eu plus de 20 000 téléchargements jusqu'à maintenant. Les réponses au sondage et la rétroaction ont été positives et soulignent l'utilité des baladodiffusions comme outil de communication, avec 96 % des répondants disant qu'ils recommanderaient cette baladodiffusion aux autres. Étant donné que la mission des bureaux des affaires étudiantes est de conseiller, d'encadrer et d'éduquer les étudiants, une baladodiffusion des affaires étudiantes représente une innovation passionnante à envisager pour les facultés de médecine.

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Introduction

Podcasts are increasingly common in medical education for the delivery of specialty-specific content.[1-3] However, podcasts from a Student Affairs perspective have been absent from the landscape.[1-3] More than previous generations, Millennials expect teaching that is convenient and relevant in its delivery, and they listen to podcasts at higher rates than the general population.[4-6] Given the mission of student affairs offices, a podcast is an innovative opportunity to connect and communicate with students beyond traditional methods such as lectures or email.

Innovation

In February 2017, our Office of Student Affairs (OSA) created a podcast called *The OSA Insider*. The goals were to disseminate information relevant to student life and to improve the perception of the OSA as an approachable space.

The podcast's launch required finding recording space and equipment; determining appropriate episode length and frequency; and selecting a media host to publish the podcast to popular platforms. An OSA assistant dean who possessed basic audio production skills served as producer and host.

Research regarding *The OSA Insider* and associated surveys was deemed exempt by the university's Institutional Review Board in December 2017.

Students (n=16) participated in focus groups and completed surveys (n=172/648) about their podcast listening habits and preferences before the podcast's launch. This feedback informed episode length, frequency, and topics. Ten months later, OSA sent out a survey about student reactions to the podcast and comfort levels in approaching the OSA with questions or concerns (n=106/644).

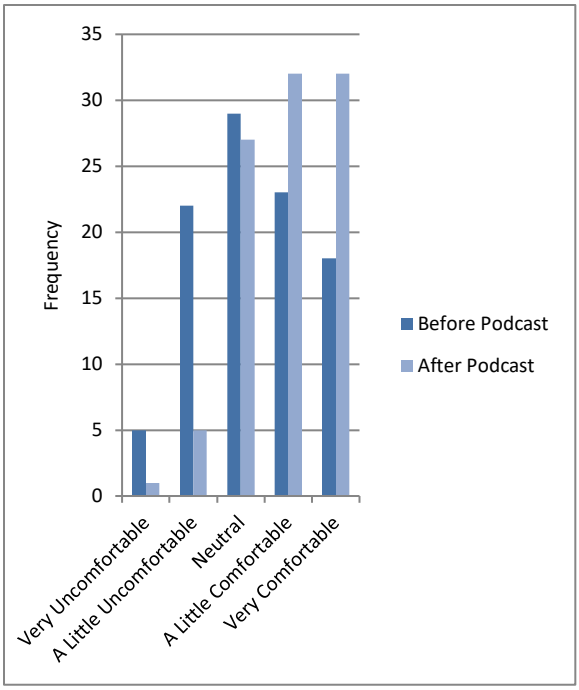
Outcomes

As of July 2019, we have produced 44 unique podcast episodes of *The OSA Insider*, each lasting approximately 20 minutes and featuring interviews on topics including transitions in medical education, career choices, burnout, and wellness. Listeners have downloaded episodes over 20,000 times and have given enthusiastically positive feedback.

Most survey respondents selected communication about important milestones and feeling less alone in their experiences as the best features of the podcast. Two survey questions asked respondents about comfort levels coming to the OSA before (M=3.3, SD=1.25) and then after (M=4.1, SD=0.95) listening to *The OSA Insider*. [Figure 1: Student Comfort] Students were significantly more comfortable coming to the OSA after the launch (paired t (82)=8.1, p <0.01, 95% CI: 0.56-0.93) when we excluded respondents who were neutral both before and after the podcast launch (13 out of 97 responses).

When asked if they would recommend this podcast, 96% (92/96) of students responded "yes." OSA finds podcasting to be a convenient way to reach large numbers of students using a platform they enjoy.

Figure 1: Student comfort in approaching the OSA with questions or concerns, pre- and post-podcast (n=97 responses)



Next steps

This innovation's strengths include its novelty in the Student Affairs terrain, ease of accessibility, ability to address student questions as they evolve, fluidity of

integration into the mission of Student Affairs offices, and subjective evaluations of its quality as an outreach tool. It requires relatively limited financial resources and faculty time; equipment such as a microphone and recorder can be purchased for approximately $500, and audio software programs are available at no cost. Average faculty time per episode is five hours. Potential limitations are that this is the experience of just one school, we performed a single follow-up survey, and most podcasting platforms do not provide data on who downloads episodes. Areas for future research include investigation into downloads by students versus other listeners, analysis of the most downloaded topics, surveying listenership on a regular basis, and collaborations with other medical schools.

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Canadian Medical Education Journal

You Should Try This!

A resident-led clinic that promotes the health of refugee women through advocacy and partnership

Une clinique dirigée par des résidents qui favorise la sante des réfugiées au moyens de la promotion de la santé et du partenariat

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Implication Statement

Longitudinal global health experiences promote cultural competency and a commitment to caring for underserved populations beyond residency. We describe a longitudinal, co-curricular local global health experience. Obstetrics and gynaecology residents partnered with the Family Medicine-led Halifax Newcomer Health Clinic to provide education and clinical well-woman care to refugee women. This resident-led initiative meets the care needs of an underserved population while promoting resident engagement in health advocacy and inter-specialty collaboration.

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Déclaration des répercussions

Les expériences longitudinales en matière de santé globale favorisent la compétence culturelle et un engagement à prendre soin des populations mal desservies au-delà de la résidence. Nous décrivons une expérience longitudinale parallèle locale en santé globale. Les résidents en obstétrique et gynécologie s'associent à la clinique de santé pour nouveaux venus d'Halifax dirigée par un groupe de médecine familiale pour offrir une éducation et des soins de santé préventifs aux réfugiées. Cette initiative gérée par des résidents satisfait les besoins en soins de santé d'une population mal desservie tout en encourageant la participation des résidents dans la promotion de la collaboration entre spécialités.

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Introduction

Canadian residency curricula must incorporate the health advocate and collaborator CanMEDS roles.[1] As we move towards competency-based medical education, clinical opportunities to build skills in these areas will be essential to meeting competency in these roles. Evidence suggests that working with underserved populations during residency promotes cultural competency and leads to a commitment to serve these populations after residency.[2] Residency programs are increasingly focused on the longitudinal integration of these global health experiences to foster a global consciousness.[3-5]

We describe a resident-led, co-curricular collaboration that provides a longitudinal local global health experience to obstetrics and gynaecology (Ob/Gyn) residents in collaboration with Family Medicine. We obtained IWK Research Ethics Board approval for the retrospective review of our clinic (No. 1024122).

A collaborative partnership

Since 2015, Canada has welcomed 44,560 Syrian refugees.[6] This has increased the number patients at Refugee Health Clinics.[7] The Canadian Clinical Guidelines for Immigrants and Refugees identified cervical cancer screening and contraception as priorities for newly resettled refugees.[8] This guideline identifies the creation of safe spaces for education and provision of clinical care as a method of improving uptake of these preventative health services.[8]

In October 2015, Ob/Gyn residents at Dalhousie University partnered with Family Physicians at the Halifax Newcomer Health Clinic (HNHC) in Halifax, Nova Scotia, Canada to run monthly well-woman clinics whose goals are to: educate refugee women about cervical cancer screening to promote uptake; provide contraceptive counselling and Intrauterine device (IUD) placement; create a discrete, female-centric environment; foster resident advocacy and cultural competency through longitudinal collaboration.

We initiated this partnership when Family Physicians at the HNHC approached residents in the Department of Obstetrics and Gynaecology to help with providing timely appointments during the initial influx of refugees and demand for IUD placements at the clinic, as they did not have a provider with the skills to provide this service. Following a successful pilot, we identified this clinic as an opportunity for ongoing partnership.

The Well-Woman clinic offers appointments to female patients who are seen through the HNHC. The clinic assigns a dedicated interpreter to women for the duration of their visit and gives them opportunity to participate in a resident-led teaching session prior to their appointment. Community partners and HNHC Physicians assist residents in identifying relevant education topics. Residents coordinate the clinic dates and resident volunteers. HNHC physicians supervise residents to provide pap testing, IUD placements and contraceptive counselling. An off-site gynaecologist provides additional supervision for more complex cases, if required. Please see Table 1 for a review of services provided. Fifty-four percent of Ob/Gyn residents in the current cohort have participated in this voluntary, co-curricular activity. Family Medicine residents, both male and female, may also participate in the clinic. One has volunteered thus far. Male residents have led teaching sessions, and this has been well received by patients. Patients choose to see a male or female resident for their clinical appointment.

Table 1. Newcomer Well-Woman clinic service provision October 2015-October 2018

		N (%)
Number of Patients Seen	2015	17
	2016	34
	2017	30
	2018	50
	Total	**131**
Language Spoken	Arabic	107 (79%)
	Amharic	7 (5%)
	Other*	17 (16%)
Pap	Yes	85 (65%)
	No	46 (35%)
IUD	Copper	8 (6%)
	Levonorgestrel IUS	9 (7%)
	Total	**17 (13%)**

* Other includes Dari, English, Farsi, French, Nepali, Spanish, Swahili, Tigrinya

Residents noted increased interest in copper IUDs in this population. As these are not currently covered for government assisted refugees under the Interim Federal Health Program, residents have partnered with a local advocacy group to write a letter to the Nova Scotia Minister of Health to recommend that they be added to the provincial formulary to secure coverage.

Future directions

The Department of Obstetrics and Gynaecology is exploring the addition of an onsite gynaecologist to supervise residents in providing a gynaecology consult clinic at the HNHC site and the integration of this clinic into the formal curriculum. This would complement the Department's existing didactic Global Health curriculum. Educators identify this combination of didactic and clinical curricula as integral to a comprehensive training program in global health.[5] Additionally, we are currently preparing a Research Ethics submission to seek patient feedback in order to better serve this population. Finally, we are building our partnership with the Family Medicine residency program to encourage increased participation by these residents.

Conclusion

The Well-Woman clinic is a longitudinal partnership between Ob/Gyn residents and the HNHC to provide care to refugee women while fostering resident advocacy, collaboration, and longitudinal engagement in local global health. Integrating this partnership into the formal curriculum will promote sustainability and universal exposure for residents.

Conflicts of interest: There are no conflicts of interest for any authors.

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Canadian Medical Education Journal

Commentary and Opinions

Should scholar be the new interprofessional competency?

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Interprofessional education (IPE) is widely endorsed as the gateway to enhanced collaborative patient care. When students from two or more professions learn about, from, and with one another in joint learning activities, interdisciplinary perceptions and attitudes improve and collaborative knowledge and skills increase.[1] In turn, such early and structured immersion into overlapping and complementary patient care roles is intended to facilitate the shared decision-making these students can expect as part of teams in their future careers.[2]

Different frameworks exist to guide integration of IPE programming into health professional curricula worldwide.[3] Most, more or less, hinge on the development of competencies deemed necessary for effective collaborative practice, such as communication and ethical values. The contribution of these skill sets to the positive and productive function of patient care teams is both apparent and universal. For example, abilities to listen and constructively consult, discuss, and debate are obvious elements for collegial interactions. Respecting patient dignity and maintaining confidentiality reflects a commitment to professional conduct and engenders trusting relationships. Such behaviours and attitudes are further recognized as collective competencies given they have been adopted by many North American health professional training programs as discipline-specific educational outcomes. By both accounts, these principles also apply to the scholar competency role.

The origins of a health professional as a scholar are rooted in the ability of physicians to practice evidence-based medicine (EBM). From 50 years ago when McMaster University launched a novel medical program where students first learned about patient problems concurrent with epidemiology and biostatistics, Canadian physicians-in-training today are meant to 'identify pertinent evidence, evaluate it using specific criteria, and apply it in their practice' as part of the scholar competency role.[4] Similarly, the American Association of Medical Colleges outlines an entrustable professional activity milestone whereby trainees 'form clinical questions and retrieve

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evidence to advance patient care'.[5] Albarqouni et al recently enlisted over 200 multidiscipline clinicians and academics from 28 countries to agree upon a set of evidence-based practice competencies for health professional teaching and learning.[6] Through Delphi survey and consensus processes, they arrived at a set of 68 core competencies further organized into introductory concepts and five main evidence-based practice steps including: ask, acquire, appraise and interpret, apply, and evaluate. While the authors acknowledge some competencies likely require modification to suit specific needs of any given discipline, most are indeed fundamental skills broadly applicable across professions. Examples include converting clinical questions into structured, answerable formats; constructing and carrying out an appropriate search strategy; distinguishing evidence-based from opinion-based clinical practice guidelines; explaining the evidence to patients and integrating their preferences into decision-making processes; and managing clinical decision-making uncertainty in practice. The consensus statement represents an important step towards unifying expectations of evidence-based practice. The details can guide instructional and assessment design and delivery in health professional curricula and for a number of programs, these may fall within the scholar competency role (or its counterparts like critical inquiry and evidence or evidence-informed patient care) (Table 1).

Table 1. Evidence-based practice competencies among Canadian health professional education frameworks

Nursing	Medicine	Occupational Therapy	Pharmacy	Physiotherapy	Respiratory Therapy
Research, Methodologies, Critical Inquiry & Evidence: The ability to seek, locate & interpret a broad range of Information knowledge, evidence, methodologies, and practice observations within the profession and across disciplines The ability to formulate research questions arising from nursing practice and analyze research findings	**Scholar:** Engage in the continuous enhancement of their professional activities through ongoing learning Integrate best available evidence into practice	**Thinks Critically:** Demonstrates effective and evidence-based problem solving and judgment to address client needs. **Engages in Professional Development:** Reviews various sources of information and new knowledge and determines applicability to practice Adapts to changes in practice using evidence, practice standards, and best practices	**Scholar:** Apply medication therapy expertise to optimize pharmacy care, pharmacy services and health care delivery Integrate best available evidence into pharmacy practice.	**Scholarship:** Use an evidence-informed approach in practice Engage in scholarly inquiry Maintain currency with developments relevant to area of practice	**Provide Evidence-informed, Patient-centred, Respiratory Care:** Apply evidence to practice **Demonstrate Critical Thinking and Reasoning Skills:** Analyze the data pertinent to the clinical situation in order to make a decision

If as Nandiwada & Kormos further contend, this work substantiates the existence and importance of evidence-based practice competencies across health professions, how do they expressly promote shared or collaborative care?[7] That is, how are these competencies truly interprofessional in nature and not simply common skills expected by many different professions? First, this set of competencies is an acknowledgement that a majority of professionals employ evidence-based practice in patient care. Although decision-making may occur within the discrete scope of a profession's practice, we can be assured of a common language when this care is informed by reported literature, such as randomized controlled trials, meta-analyses, or clinical practice guidelines. Like the fundamental aspects of interprofessional communication (e.g. consultation, negotiation, respect, and active listening techniques) these competencies represent an opportunity for standardization of practice principles across patient care providers. Furthermore, when teams of various disciplines convene to develop treatment protocols or care pathways, there is a shared understanding of how the evidence under consideration may be interpreted. Clinicians may enlist similar approaches

to navigate incomplete available data or ambiguous study findings to make treatment choices.

Interprofessional competencies are meant to promote collaborative care that ultimately improves patient outcomes. Integration of evidence-based competencies into shared decision-making clearly has the potential to do so. Patient adherence may be enhanced when care providers can clearly explain the data underpinning the rationale for the selected treatment and offer realistic estimates of potential risk. Clinicians who can interpret and synthesize a wide array of literature may have greater abilities to individualize care while also incorporating patient preferences. In this regard, optimal evidence-based practice must be enabled by the communication and collaboration skills endorsed by both profession-specific and interprofessional competency frameworks. Just as effective team-based care must draw upon the collective contributions of its diverse members, quality healthcare also relies on this complement of a clinician's knowledge, skills, and behaviors.

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Canadian Medical Education Journal

Commentary and Opinions

Burnout

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I run up and down the corridor
Ticking tasks off my list
Floor to floor
Is there is anything I have missed?
Potassium - check, fluids – check
It's my anniversary, did I message my wife?
I'm a wreck
Sleep is scant
And the hours long
This isn't a rant
Perhaps I'm not as strong?
My stomach has an ache
I skipped dinner
I really need a break
Will things get easier for this beginner?
Surely, I am not alone
Other doctors feel like this
And it should be known
If there is light in this abyss
I do it for life
Shocking rhythms that are flat
Using medications and the surgical knife
Who else can say that?
Optimism overwhelms me
I can push through this night
Better skilled shall I be
The end is in sight
The pager rings loud
But before I go fleeing
I'll arrange to meet my crowd
To look after my well being.

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Canadian Medical Education Journal

Commentary and Opinions

A definition for coaching in medical education

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Consider world champion tennis player Roger Federer. As the number 1 ranked tennis player for a record 310 weeks, he represents one of the most successful professional athletes of our time. To what does he owe his success? While he undoubtedly possesses a remarkable amount of self-motivation, dedication, and athleticism; there is another factor to consider: he has a coach. In fact, he has a team of coaches who work on every aspect of his game with a common goal of performance enhancement. In a recent tribute to his coaches on social media, Federer wrote "Could never have been the oldest #1 without my team. Thank you to everyone who has helped me along the way".[1]

Despite its wide application in other high-performance professions such as athletics, music, and business, coaching has only recently gained attention within medicine and medical education. The adoption of Competency-Based Medical Education (CBME) and emphasis on observation has led to increased use of coaching terminology within the medical education community. However, a clear definition of coaching is lacking, and people often use the term coaching interchangeably with related terms such as teaching and mentoring.[2] We need a clear operational definition of coaching in order to advance the use of coaching within medical education and to conduct meaningful research on this topic.

We believe, coaching is a process that guides a learner towards performance improvement. Coaching requires establishment of supervisor-learner rapport, setting of expectations, and observation of the activities that are being developed. Following observation, the supervisor and learner engage in a bi-directional conversation which leads to meaningful feedback and practical suggestions for performance improvement. Supervisors may document their conversations to provide a developmental trajectory over time. Educational researchers have previously defined coaching as a "one-to-one conversation focused on the enhancement of learning and development through increasing self-awareness and a sense of personal responsibility, where the coach facilitates the self-directed learning of the coachee through questioning, active listening, and appropriate challenge in a

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supportive and encouraging climate".[3] However, this definition is restrictive in its focus on self-directed learning. Further, it lacks important components of coaching such as learner observation for the purpose of providing meaningful feedback, and therefore limit the utility of this definition.

We consider coaching to be more than giving feedback. While feedback provides information about what the coach observed compared to an expected standard, coaching involves providing practical suggestions for improvement with the aim of enhancing learner performance at a specific activity. To go back to the sports analogy, Federer's tennis coach would not simply tell him his forehand swing is incorrect. The coach would give specific suggestions for improvement such as adjusting the position of the body during the forehand swing.

Coaching in a medical education context has been conceptualized into two types.[5] Coaching in the Moment (CiM) refers to coaching that occurs between a clinical teacher and learner within the clinical practice environment. CiM includes observation, feedback and actionable suggestions for performance improvement. CiM in our Federer scenario is where one of Federer's tennis coaches watches his swing during a practice session.

The second type of coaching is Coaching over Time (CoT). CoT refers to coaching that occurs between a supervisor and learner outside of the clinical environment. Observation is based primarily on the learner's performance data that has been collected and compiled. Similar to CiM, feedback and suggestions for performance improvement remain key components. CoT is imperative to guiding learners in their clinical progress and promoting their development as competent clinicians. CoT in our Federer scenario is when Federer meets with his coach every few months to review his on-court performance metrics and determine how he can improve them.

Two terms that people frequently use interchangeably with coaching are teaching and mentoring. Teaching typically follows a directive approach where the goal of the interaction is acquisition of knowledge, skills, or attitudes on the part of the recipient. Teaching differs from coaching as teaching does not rely on observation or conversation. Mentoring refers to a confidential, non-judgmental relationship between two individuals with the ultimate goal of encouraging the mentee to take charge of their own development.[4] Mentoring differs from coaching as mentoring is not focused on performance improvement but rather seeks to provide guidance and support.

Coaching is gaining popularity within medicine and medical education yet there is a conceptual tension surrounding how it differs from teaching and mentoring. At present, coaching within medical education is lacking a clear operational definition that is relevant to both education researchers and front-line clinicians. We have advanced one such definition emphasizing coaching as a process that guides a learner towards performance improvement. We look forward to productive debate.

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Letters to the Editor

Few more hidden variables which would fortify person centred approach of self-regulated learning

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Dear Editor,

With great enthusiasm I read the article by *Vilppu H et al.*[1] regarding the application of person centred approach in identifying regulation strategy profiles among students and would like to commend the authors for highlighting self-regulated learning. With the increasing vastness of knowledge found in the literature, self-regulated learning patterns play an increasingly crucial role in harnessing the lifelong learning skills of medical graduates. In addition to the points brought out by the authors, I would like to emphasize motivation and epistemological beliefs in determining the persistence demonstrated by the students towards life-long learning.

Firstly, when a student enters the medical school, he/she possess a certain degree of motivation. In addition to the learning strategies, the baseline motivation also gets modulated by self-regulatory 'epicycles'.[2] In developing countries like India, students practice a reproduction-directed approach to learning involving rote memorization in schools and when they try to apply the same way for learning voluminous subjects such as anatomy, they tend to get demotivated easily. This is one of the problems we frequently encounter during mentoring sessions. Rather, I could say that the inability to find the appropriate learning strategy tends to affect the level of motivation demonstrated by students towards learning the content and a significant proportion of struggling learners get lost in this vicious cycle.

Some students, after learning lessons from the initial failures, try to figure out that their level of motivation could get boosted up if they would accomplish smaller sub-goals every day.[3] At the end of an interesting study, *Eckerlein N et al.*[4] postulated that motivational difficulties i.e. struggle of students to keep the motivational level higher up while studying tend to vary on a daily basis and it could not be considered a person-specific variable. In addition, these motivational difficulties tend to alter the

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amount interest students have towards learning. For example, when a student starts feeling that the test portion is too difficult, he/she encounters motivational difficulty. If the same persists, he/she might lower the amount of effort invested towards preparing for the exam and potentially, land up in failure.

Secondly, the epistemological beliefs i.e., students' self-held perceptions about the quantum of human knowledge possessed by him/her, tend to play a significant role in self-regulated learning. When students are given a task during self-directed learning sessions, some students try to master things quickly from the given content and they tend to correlate it with positive self-efficacy. On the other hand, a proportion of students try to look out for the relative certainty of knowledge and do not get satisfied unless they figure out specific meanings or contexts. *Schommer,*[5] in her experiment, gave a controversial text to two categories of students and found that the outcomes differed according to the epistemological beliefs. According to her, these epistemological beliefs influences students in choosing the cognitive strategies and influences the resultant performance in academic tasks.

Thirdly, as suggested by the authors, it is imperative to diagnose the learning difficulties of students in order to support their learning regulation profiles. Particularly, some students might possess the cognitive pre-requisites for effective self-regulated learning but are still unable to incorporate the strategies into day-day usage.[6] Owing to this deficiency, they might suffer from knowledge-action gap and in most cases, analysing under motivational regulation lens might offer the required solution.

To conclude, I support the usage of person-centred approach to help medical educators in explaining the micro-dynamics of learning. However, from a practical perspective, if the motivation regulation profiles of the students were not well understood, the person-centred approach would not be holistic. In addition, it is prudent for the medical educators to recognize diversity with respect to epistemological beliefs in self-regulated learning. Identification of individualized shortcomings should be the prime step for person-centred approach, especially while making remediation plans for struggling learners.

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Images

Head

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To fully understand something you must break it down to its simplest form. This is also true for medicine. In order to grasp challenging concepts, you need to have a basic comprehension of all the components, you need to see the forest before the individual trees. As a medical student I was confronted with new information and then relied on my prior learning to build a more complex and better picture.

This piece was constructed by adding small strips of paper folded in distinct patterns that as a collection form an overall image.

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