

Learning behaviour and preferences of family medicine residents under a flexible academic curriculum

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Abstract

Objective To determine family medicine residents' learning behaviour and preferences outside of clinical settings in order to help guide the development of an effective academic program that can maximize their learning.

Design Retrospective descriptive analysis of academic learning logs submitted by residents as part of their academic training requirements between 2008 and 2011.

Setting London, Ont.

Participants All family medicine residents at Western University who had completed their academic program requirements (N = 72) by submitting 300 or more credits (1 credit = 1 hour).

Main outcome measures Amount of time spent on various learning modalities, location where the learning took place, resources used for self-study, and the objective of the learning activity.

Results A total of 72 residents completed their academic requirements during the study period and logged a total of 25 068 hours of academic learning. Residents chose to spend most of their academic time engaging in self-study (44%), attending staff physicians' teaching sessions (20%), and participating in conferences, courses, or workshops (12%) and in postgraduate medical education sessions (12%). Textbooks (26%), medical journals (20%), and point-of-care resources (12%) were the 3 most common resources used for self-study. The hospital (32%), residents' homes (32%), and family medicine clinics (14%) were the most frequently cited locations where academic learning occurred. While all physicians used a variety of educational activities, most residents (67%) chose self-study as their primary method of learning. The topic for academic learning appeared to have some influence on the learning modalities used by residents.

Conclusion Residents used a variety of learning modalities and chose self-study over other more traditional modalities (eg, lectures) for most of their academic learning. A successful academic program must take into account residents' various learning preferences and habits while providing guidance and training in the use of more effective learning methods and resources to maximize educational outcomes.

EDITOR'S KEY POINTS

- This study found that lectures are neither residents' only nor their preferred method of learning. Therefore, academic programs that rely mostly on lectures for educational delivery might fall short in treating residents as adult learners who are capable of identifying and addressing their own unique learning needs.
- Residency programs can better accommodate residents' learning preferences by offering flexible methods, delivery, and settings of learning. Such programs would provide opportunities for residents to develop self-directed learning skills.
- Given the evidence that practice behaviour established during residency persists after graduation, emphasizing self-directed learning skills during residency training can help residents develop skills that they can use for the rest of their careers.

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Les modes d'apprentissage préférés des résidents en médecine familiale dont le curriculum académique est flexible

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Résumé

Objectif Vérifier les modes et méthodes d'apprentissage que les résidents en médecine familiale préfèrent en-dehors du contexte clinique afin de mieux orienter le développement d'un programme académique capable de maximiser leurs connaissances.

Type d'étude Analyse descriptive rétrospective des rapports académiques fournis par les résidents entre 2008 et 2011, conformément aux exigences de leur formation universitaire.

Contexte London, Ontario.

POINTS DE REPÈRE DU RÉDACTEUR

- Les résultats de cette étude indiquent que l'utilisation de documents écrits n'est pas la seule méthode d'apprentissage des résidents, ni même celle qu'ils préfèrent. Par conséquent, les programmes universitaires qui reposent principalement sur des lectures pour favoriser la formation risquent de juger les résidents incapables de déterminer et de choisir leurs propres besoins de formation.
- Pour mieux tenir compte des méthodes d'apprentissage que préfèrent les résidents, les programmes devraient offrir des méthodes, des façons de faire et des contextes d'apprentissage flexibles. Les résidents pourraient ainsi développer les modalités d'apprentissage qu'ils ont eux-mêmes choisis.
- Compte tenu des données qui indiquent que les habitudes de pratique acquises durant la résidence persistent après l'obtention du diplôme, le fait d'encourager les étudiants à choisir leurs propres méthodes d'apprentissage durant la résidence pourrait leur permettre de développer des habiletés qui leur serviront durant toute leur carrière.

Cet article a fait l'objet d'une révision par des pairs.

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Participants Tous les résidents en médecine familiale à l'Université Western (N = 72) qui ont complété les exigences de leur programme universitaire et accumulé au moins 300 crédits (1 crédit = 1 heure).

Principaux paramètres à l'étude Le temps consacré aux diverses modalités d'apprentissage, l'endroit où cet apprentissage a eu lieu, les ressources utilisées pour l'auto-apprentissage et les objectifs de l'activité d'apprentissage.

Résultats Un total de 72 résidents ont complété leurs exigences de formation durant l'étude et rapporté un total de 25 068 heures d'apprentissage universitaire. La plupart du temps était consacré à de l'auto-apprentissage (44 %), à des séances d'enseignement données par les médecins du personnel (20 %), à des conférences, cours ou ateliers (12 %) et à des séances de formation médicale continue (12 %). Les trois ressources le plus souvent utilisées pour l'auto-apprentissage étaient les manuels de référence (26 %), les revues médicales (20 %) et les ressources disponibles au point d'intervention (12 %). Les endroits le plus fréquemment mentionnés comme sites d'apprentissage étaient l'hôpital (32 %), les maisons d'hébergement (32 %) et les cliniques de médecine familiale (14 %). Alors que tous les médecins utilisaient des activités de formation variées, la plupart des résidents (67 %) avaient choisi l'auto-apprentissage comme principale méthode d'apprentissage. Le sujet sur lequel portait l'apprentissage semblait avoir une influence sur la modalité d'apprentissage choisie par le résident.

Conclusion Les résidents utilisaient diverses modalités d'apprentissage et choisissaient l'auto-apprentissage de préférence à d'autres modalités traditionnelles (comme les lectures) pour la plus grande partie de leur apprentissage universitaire. Pour avoir du succès, un programme universitaire doit tenir compte des habitudes des résidents et des modes d'apprentissage qu'ils préfèrent, tout en leur fournissant de l'aide et de la formation sur l'utilisation des méthodes et des ressources susceptibles de donner les meilleurs résultats.

With the rapid expansion of information in medicine, identification of effective education strategies to maximize residents' learning becomes paramount. The education literature suggests that residents are adult learners who learn best when they self-direct their learning by assessing their own learning needs, identifying resources, formulating goals or plans, and evaluating outcomes.¹⁻⁴ Reinforcing these self-directed learning (SDL) skills early on in medical trainees' careers might have the potential to help physicians maintain relevance after residency and optimize patient care.⁵ For instance, graduates under an SDL-based medical curriculum were found to be more up-to-date in their knowledge of current management of hypertension than graduates of a traditional medical curriculum were.⁶ Another fundamental principle of adult learning is that adult learners are influenced by their experiences and that not all adults learn the same way.⁷ Therefore, learning can be further enhanced with concordance between educational formats (eg, small group vs lectures vs online modules) and learning preferences.²

As the accrediting body of Canadian family medicine (FM) residency programs, the College of Family Physicians of Canada establishes accreditation standards for the FM curriculum, which typically comprises a clinical and an academic component. The College's *Red Book*, published in 2013, calls for FM academic programs to provide residents with greater autonomy for their academic learning and states that programs must offer a variety of teaching methods to take into account residents' different learning styles.⁸ However, the predominantly lecture-based nature of the academic curriculum in most residency programs in Canada provides limited opportunities for residents to individualize their learning and fulfil their unique learning needs.^{9,10}

With the shift toward the Triple C Competency-based Curriculum, the specific needs of the learners and the flexibility of programs to meet those needs become more important.¹¹ Recognizing residents' preferred learning modalities will allow tailoring of educational resources and opportunities to residents' needs and potentially increase the efficiency of their learning. The goal of this study is to determine the learning behaviour and preferences of FM residents in order to help guide the development of an effective academic program that can maximize their learning.

METHODS

This study is a retrospective descriptive analysis of an anonymized database containing the academic learning records of residents enrolled in the FM residency training program at the Schulich School of Medicine and Dentistry at Western University in London, Ont, that were submitted

as part of the training requirements. Ethics approval from Western University's Research Ethics Board was not necessary for this study, as the database did not contain any personal identifying information.

The academic program at Western University provides residents with weekly protected time and non-mandatory academic half-day sessions (eg, lectures, small group learning). The requirements are based on the current credit-based continuing medical education model in which each resident has to complete a minimum of 300 hours (1 hour=1 credit) of learning in eligible learning activities for predetermined educational objectives over the 2-year training program. Eligible learning activities include academic half-day sessions, accredited continuing medical education events, rounds, practice audits, and self-study.

Academic records submitted by residents between July 1, 2008, and May 31, 2011, were used. Residents who had submitted 300 or more credits (ie, completed their academic program requirements) were included in the study. Each record in the database contained a resident's unique identifier (not linked to any personal identifying information), type of learning, description of the learning activity, location where the learning took place, amount of time spent on the activity, and the objective of the learning activity.

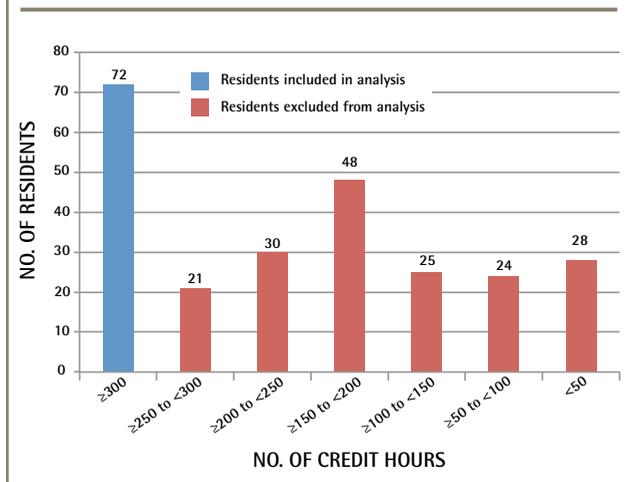
Descriptive statistics were used to analyze the data. The analyses focused on the types of learning residents' used, time spent on various learning modalities, location of where the learning activities took place, resources used for self-study, and how the topic to be learned affected residents' choice of learning method. Sensitivity analyses were conducted to assess the possible effect on the results of including all residents with more than 250 credits, as well as all residents with any credit entry.

RESULTS

A total of 248 unique resident identifications were found in the database of academic records. From these resident identifications, 72 residents met the inclusion criteria and their records were used for the analysis (**Figure 1**). These residents encompassed 3 cohorts, and only 1 of these cohorts had the full 2 years to fulfil and submit their credit requirements by the end of the study period.

These 72 residents submitted 16 453 entries and reported spending a total of 25 068 hours on academic activities over the 2-year study period. **Table 1** defines the types of learning residents used and includes examples of each. As seen in **Figure 2**, time spent on self-study made up most of these hours, followed by staff physicians' teaching sessions. Lecture-based didactic sessions accounted for less than 30% of residents' allocated time for academic learning activities. An analysis

Figure 1. Number of credit hours on academic activities submitted by residents: N = 248.



of individual residents' credit entries showed that most residents (48 of 72 [67%]) chose self-study as their primary mode of learning as compared with the 7 of 72 (10%) residents who chose large group didactic sessions as their primary learning method.

Figure 3 shows the proportion of time that residents spent using various resources for self-study. The spectrum

of resources used varied from traditional textbooks, medical journals, and online modules to YouTube videos in certain instances. Textbooks were the most commonly used resource, followed by medical journals and point-of-care summaries.

Most of the residents' academic learning took place in the hospital setting and at home (Figure 4). About 3% of the learning took place in nontraditional settings such as the gym, coffee shops, and airports (grouped under the "other" category).

This sample of residents reported using an average of 7 learning modalities to fulfil their academic requirements. All residents reported engaging in some form of self-study activity, as well as attending teaching sessions by staff physicians (Figure 5).

Figure 6 shows the distribution of the top 4, as well as all other (grouped under the "other" category), learning modalities used to fulfil the academic credit requirements for each topic. Together, self-study, staff physicians' teaching sessions, postgraduate medical education sessions, and conferences, courses, or workshops accounted for more than 80% of the hours residents spent learning each topic. To learn about more procedural-based topics such as surgical skills, residents devoted the highest percentage of time to staff physicians' teaching sessions.

Table 1. Descriptions and examples of the types of learning used by residents

TYPE OF LEARNING	DESCRIPTION	FORMAT	EXAMPLES
Self-study	Self-directed learning	Independent	Online CME activities, CFPC Pearls exercise
Teaching sessions by staff physicians	Teaching sessions organized by staff physicians during family medicine block training	Usually small group	Ethics lecture, behavioural medicine lectures
Conferences, courses, or workshops	Any accredited or unaccredited conferences, courses, or workshops	Large or small group	Family Medicine Forum conference, Primary Care Today conference
PGME sessions	Teaching sessions as part of academic half-days	Usually large group, didactic sessions	Academic half-days, summer series
Residents' sessions	Peer teaching sessions organized by residents during family medicine block training	Usually small group	Case presentation on migraines, journal club activities
Hospital rounds	Hospital-based departmental rounds	Usually large group, didactic sessions	Departmental rounds (eg, general surgery, endocrinology, family medicine)
Other			
• Research or publications	Research not related to residency project	Independent	Research study on antidepressants
• Life support programs	Advanced life support programs	Small group	ACLS, ALSO, ATLS, NRP, PALS
• Practice audits or quality assurance	Mandatory practice audit or quality assurance exercise	Independent	Chart audits

ACLS—Advanced Cardiac Life Support, ALSO—Advanced Life Support in Obstetrics, ATLS—Advanced Trauma Life Support, CFPC—College of Family Physicians of Canada, CME—continuing medical education, NRP—Neonatal Resuscitation Program, PALS—Pediatric Advanced Life Support, PGME—postgraduate medical education.

Figure 2. Proportion of residents' time spent using various learning modalities: Total number of hours analyzed was 25 068.

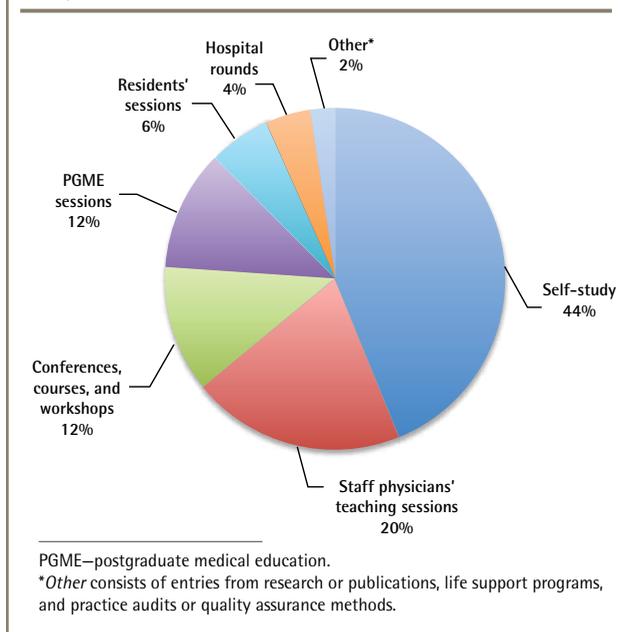


Figure 4. Proportion of residents' time spent learning in various locations: Total number of hours analyzed was 25 068.

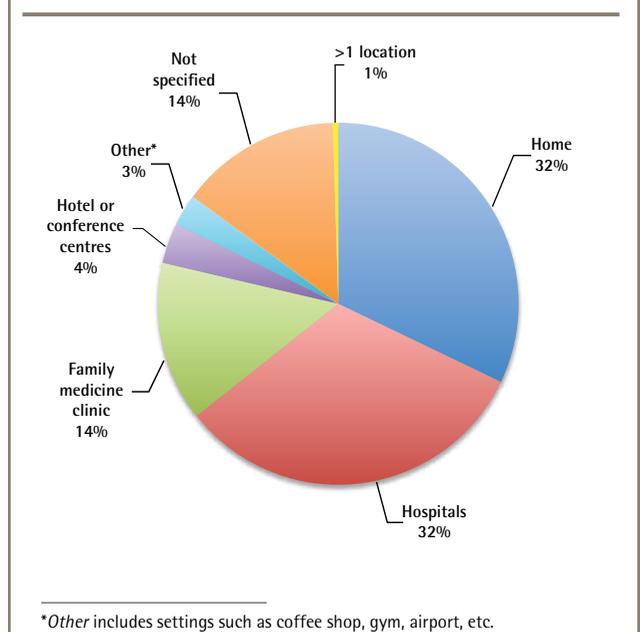
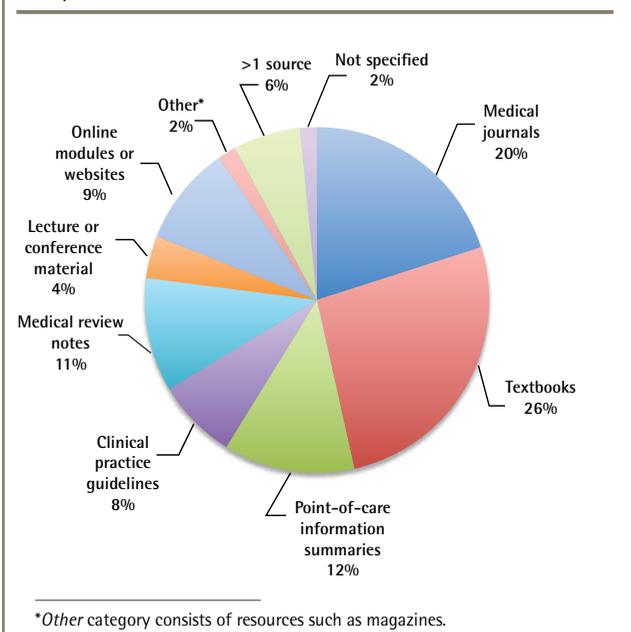


Figure 3. Proportion of residents' time spent using various resources for self-study: Total number of hours analyzed was 10 985.



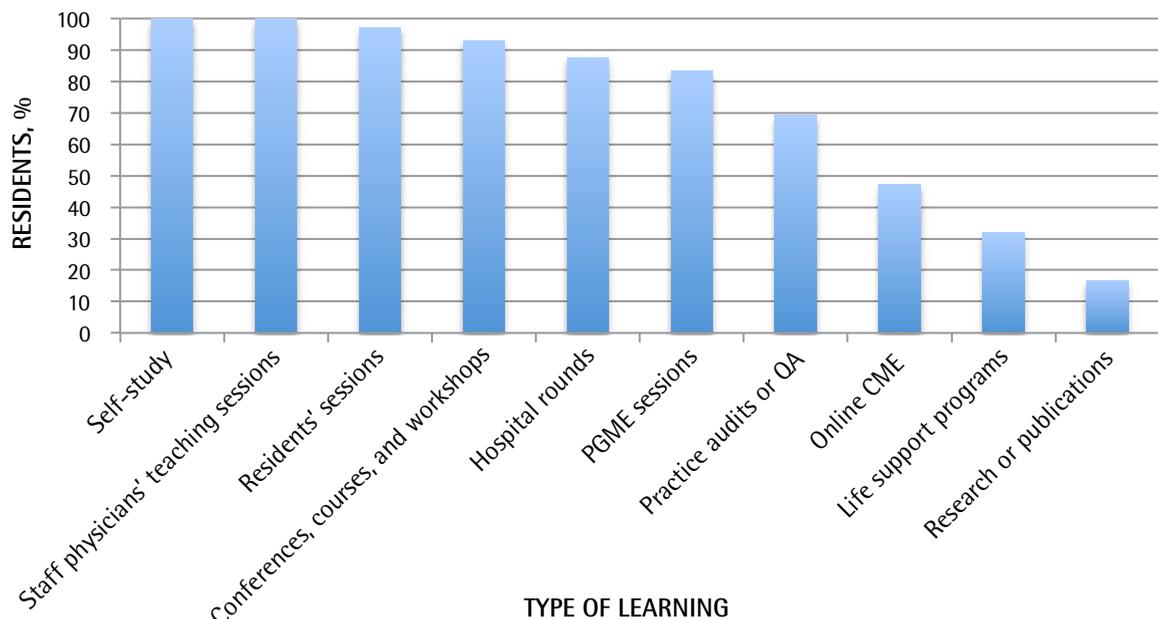
Sensitivity results

Sensitivity analyses comparing findings from all residents who had submitted at least 1 credit entry (N=248), at least 250 credits (n=93), or at least 300 credits (n=72) did not influence the main study finding—self-study was still residents' primary learning modality.

DISCUSSION

Western University's innovative academic program in FM was designed to offer residents maximum protected academic time to self-direct their learning, as well as to engage in learning modalities that are concordant with their experiences and learning styles. The principal finding that FM residents preferred self-study as opposed to more passive learning modalities to fulfil their academic credit requirements is encouraging, as it implies that residents are adult learners who prefer more self-directed choices for their academic learning. Such choices include traditional sources such as textbooks, clinical practice guidelines, and journals that provide clinical information.

Furthermore, while about two-thirds of residents chose self-study as their primary modality of learning, a smaller percentage of residents preferred to learn from more traditional teaching methods such as lectures and discussions. This finding is not surprising because each resident is unique, and it highlights the strength of this curriculum to allow tailoring of the educational experience to individual residents' preferred learning styles. Finally, all residents reported using a variety of modalities for their learning, suggesting that they preferred a blend of didactic and SDL experiences. It is worth noting that residents in this study reported spending close to one-third of their academic time learning at home. Providing residents with maximum unscheduled time to learn at times and in environments (eg, at home) when

Figure 5. Percentage of residents who used various learning modalities

CME—continuing medical education, PGME—postgraduate medical education, QA—quality assurance.

they are most receptive to learning might be a consideration for all academic programs.

To our knowledge, no other studies have evaluated residents' self-reported use of various modalities for their academic learning outside of the clinical setting in Canada. Furthermore, information in the literature on how Canadian residents learn outside of the clinical setting is limited. A review of FM program descriptions on the Canadian Resident Matching Service websites and individual program websites showed that the academic curriculum in most FM programs is delivered through mandatory academic sessions consisting predominantly of lectures and some small group components.¹² Thus, while approaches to improving the quality of the FM academic sessions have been reported, Canadian FM residents remain restricted in their ability to choose the timing and the educational format that best meets their individual needs.^{10,13}

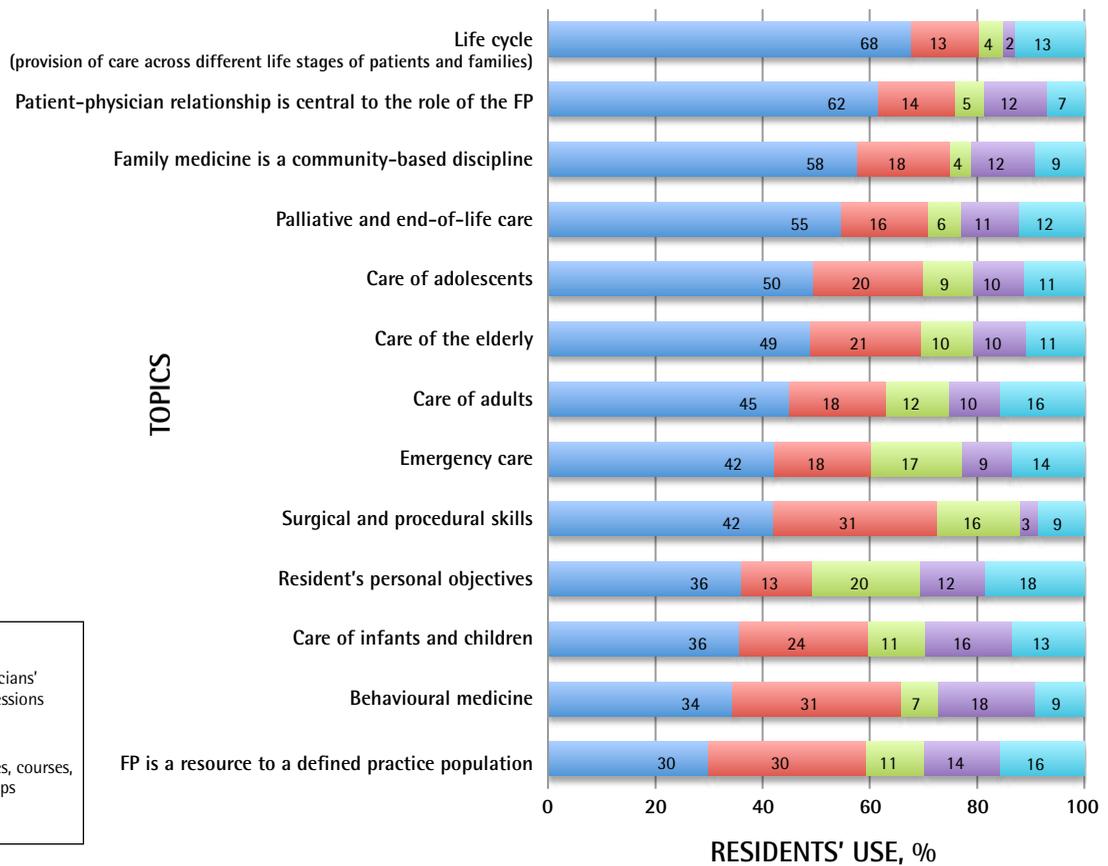
Several implications can be drawn from this study that have importance for the FM academic curriculum. Findings from this study suggest that lectures are neither residents' only nor their preferred method of learning, and therefore academic programs that rely mostly on lectures for their educational delivery might fall short in treating residents as adult learners who are

capable of identifying and addressing their own unique learning needs. As seen in the curriculum described in this study, residency programs can better accommodate residents' learning preferences by offering flexible methods, delivery, and settings of learning. An added benefit of this curriculum is that it provides opportunities for residents, as adult learners, to develop SDL skills. Given the evidence that practice behaviour established during residency persists after graduation, emphasizing SDL skills during residency training can help residents develop skills that they can use for the rest of their careers.^{14,15}

Limitations

This study has several limitations. First, the data were based on self-reports from residents and might be subject to recall errors. Second, because this was a secondary retrospective analysis of residents' academic activities, the lack of demographic information about residents precluded investigation of the possible influence of residents' characteristics (eg, sex, age, year of residency, location, and academic background) on how they approached their academic learning. Furthermore, while the database identified 248 unique individuals who came from 3 cohorts of residents, only 1 of these

Figure 6. Residents' use of learning modalities for various topics



CME—continuing medical education, PGME—postgraduate medical education.

*Other category includes residents' teaching sessions, hospital rounds, practice audits or quality assurance methods, online CME, life support programs, and research or publications.

cohorts had the full 2 years to fulfil and submit their credit requirements. Without knowing the year in which they entered residency, it could only be speculated that the 72 residents with fulfilled credit requirements represented those who had finished residency before the study end date.

While this study provides the first characterization of FM residents' self-reported use of various learning modalities for academic learning, the quality of such learning has yet to be determined. Previous studies have shown that traditional didactic teaching modalities such as lectures have a negligible effect on physician behaviour and patient outcomes.^{16,17} Thus, it would be of value for future studies to evaluate whether residents' increased time spent on self-study and away from lectures translates into better educational outcomes, such as residents' knowledge, satisfaction, and standardized test scores, as well as SDL behaviour later on in practice. Furthermore, it is worthwhile to explore the rationale behind residents' choices of learning modalities.

Conclusion

This study has identified self-study; staff physicians' teaching sessions; conferences, courses, or workshops; and postgraduate medical education sessions as the educational modalities most commonly used by FM residents for their academic learning. It advances our knowledge of how FM residents choose to shape their academic learning when given the choice to do so. These findings can be used to guide the design of academic programs for residents, as well as to align program resources with residents' preferences.

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Contributors

Ms Sy, Dr Wong, and Ms Boisvert contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

Competing interests

None declared

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