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Volunteer physician engagement: an investigation of a national simulation based training program

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Key Words: volunteer, engagement, qualitative research, medical education, critical care

Abstract

Objectives: Conceptual clarity on physician volunteer engagement is lacking in the medical literature. The aim of this study was to present a conceptual framework to describe the elements which influence physician volunteer engagement and to explore volunteer engagement within a national educational program.

Setting: The context for this study was the Acute Critical Events Simulation (ACES) program in Canada, which has successfully evolved into a national educational program, driven by physician volunteers.

Method: A conceptual framework was constructed based on an extensive literature review and expert consultation. Secondary qualitative analysis was undertaken on fifteen semi-structured interviews conducted from 2012 to 2014 with participants, including program directors and health care professionals across Canada. An additional fifteen interviews were conducted to achieve thematic saturation. Data was analyzed iteratively and inductive coding techniques applied.

Results: From 2010 to 2014 the program recruited 73 volunteer health care professionals who contributed to the creation of educational materials and/or served as instructors. The majority were physicians. From the physician volunteer data, eleven themes emerged. The most prominent themes included volunteer recruitment, retention, exchange, recognition, educator network, and quasi volunteerism. Captured within these interrelated themes were the framework elements, including the synergistic effects of emotional, cognitive and reciprocal engagement. Behavioural engagement was driven by these factors along with a cue to action, which led to contributions to the ACES program.

Conclusion: This investigation provides a preliminary framework and supportive evidence towards understanding the complex construct of physician volunteer engagement. The need for this research is particularly important in present day, where growing fiscal constraints create challenges for medical education to do more with less.

Article Summary

Strengths and limitations of this study

- First study to synthesize key elements of physician volunteer engagement into a conceptual framework.
- Covers an issue little investigated and draws upon a wider theoretical background.
- Qualitative data obtained provides new insights into physician volunteer engagement, which may be useful in practically improving volunteer engagement strategies.
- Our findings were obtained in one country, within one national program.
- Explored volunteer engagement in a highly engaged group of physicians, study was not able to explore disengagement.

Introduction

Physician volunteers are essential to health care delivery and medical education.[1] Despite the growing needs to optimize volunteer physician engagement, there is a paucity of data on how to improve and maintain engagement. Volunteerism can be defined as any altruistic act, which is undertaken without financial gain while engagement has been defined as being "actively committed" or "to involve oneself or become occupied; to participate."[2,3]

Physicians appear to highly value their role as volunteers. In a US study by Gruen et al., 95 % of physicians surveyed rated community participation as important".[4] Yet, in a national survey of 319 physicians, only 39% participated in volunteer activities.[5] Therefore, there appears to be a wide gap between the perceived importance of volunteering and its translation into action or engagement. Such studies illustrate the need to better understand the determinants of physician volunteer engagement and the ways in which it can be optimized.

Most of the medical literature on engagement is centered on the patient and behaviors that promote health. A few isolated studies focusing on physician engagement were located but there is currently no accepted model describing the multifaceted dimensions of physician volunteer engagement.[6-10] We can draw from the social science literature in order to define and examine the various components of engagement.

The concept of engagement, specifically, school engagement has been synthesized in a review by Fredricks et al.[11] They present engagement as a multifaceted construct including three dynamically interrelated components: behavioural, emotional and cognitive engagement. Behavioural engagement is related specifically to the on task behavior. Emotional engagement is related to the value of the tasks as determined by the individual. Value is further divided into 4 components: "interest (enjoyment of the task), attainment value (importance of doing well on the task for confirming aspects of one's self-schema), utility value (importance of the task for future goals), and cost (negative aspects of engaging in the task)."[11] Cognitive engagement refers to an individual's motivational goals and self-regulated learning. This concept can be further described as a psychological investment in learning, understanding, and mastering knowledge or skills with a "desire to go beyond the requirements, and a preference for challenge."[11]

In this study, we sought to develop a conceptual framework to describe and explore the components and theoretical underpinnings of physician volunteer engagement. We began our investigation with a secondary analysis of a comprehensive needs assessment in a quality improvement initiative aimed at the overall enhancement of the Acute Critical Events Simulation (ACES) program. Later, we extended this initial work by obtaining additional data to provide evidence towards understanding the complex construct of physician volunteer engagement.

Context

The ACES Program is a national educational program aimed at improving the proficiency of individuals and teams involved in the early management of critically ill patients. Nurses, respiratory therapists, and physicians who are the first to respond to a patient in crisis come from various disciplines and practice in diverse milieus. Their experience managing acutely ill patients is often very limited given the low incidence of critical illness. Yet, clinical studies indicate that early recognition and management are most effective in lowering both morbidity and mortality. Randomized controlled trials and guidelines emphasize the importance of the 'golden-hour' in patients with conditions such as myocardial infarction, stroke, and sepsis.[12-16] The ACES program includes various simulation modalities delivered online or face-to-face as well as books and didactic material. It also includes instructor certification courses. Most of the educational materials have been customized to meet the needs of different groups of learners.

This program was initially developed from the vision and efforts of a small collective of Canadian critical care physicians who volunteered their time and expertise. It has successfully evolved into a national educational program, has been acquired by the Royal College of Physicians and Surgeons of Canada (RCPSC), and continues to advance and grow. Volunteers remain fundamental to the ACES program. They create materials, organize courses, teach, and conduct research. From 2010 to 2014 the program recruited a total of 73 volunteers, 69 of whom were physicians. The need for volunteers is increasing due to increasing demand, addition of new forms of simulation, growth of online curriculum and anticipated movement to a competency-based program.

Method

A conceptual framework was constructed; data collection instruments were selected and developed based on this model; qualitative data collection was performed and analyzed iteratively.

Conceptual Framework

A conceptual framework is meant to explain the key factors, constructs, or variables, and their presumed relationships.[17,18] An extensive literature review along with expert consultation informed the development of the framework. We developed the model depicted in Figure 1, to explore volunteer physician engagement in a comprehensive manner. For our study, the physician behavior of participation as a volunteer is the dependent variable. All other elements, which contribute and lead to this behavior, are the independent variables under investigation. In this figure, we have depicted two physicians and one leader for simplicity. In reality there may be many leaders and physicians. We define a leader as an individual within the group who influences others towards a mutual purpose or common goal. We define an individual's engagement as a multidimensional construct including emotional and cognitive engagement which ultimately can lead to behavioral engagement, with tasks directed toward contributing to organizational development and/or a specific domain, such as education, quality and safety, etc.

<Insert Figure 1 about here>

An individual's overall engagement is impacted by their demographic and psychosocial characteristics. The emotional and cognitive components drive behavior. The bidirectional arrows between these components indicates that the presence and/or development of one component may impact the other. The behavior itself may further promote the emotional and cognitive components and enhance volunteer behaviors (indicated by the arrow back to the emotional and cognitive components). In addition, the behavior requires a "cue to action" or trigger (which can be either intrinsic or extrinsic to the individual). A simplistic example of an extrinsic "cue to action" may involve the director of the program contacting a volunteer to participate.

Individual volunteers have the potential to impact each other and synergistically enhance engagement of each other. We have termed this variable "reciprocal engagement." This is akin to mutual engagement involving not only individual actions/attributes but also the actions/attributes of others.[19] This relationship and enhanced engagement potential is likely secondary to the impact on the individuals' emotional, cognitive and behavioral components and/or may provide a trigger leading to the behavior.

Leaders have their own intrinsic characteristics, emotional and cognitive components which drive the behavior. Reciprocal engagement may also synergistically increase the engagement of both the leader and individuals.

Ultimately, the behavioral engagement of the individual volunteers can lead to increased organizational performance.[20] Sustainability of the volunteers likely depends on these

factors being maintained and may fluctuate for an individual over time with periods of greater and lesser engagement, for example based on the presence or absence of a "cue to action" and also based on changes in organizational culture, leadership and other individuals.

Data Collection and Analysis

Interviews were conducted between October 2012 to August 2015. Participant selection was carried out using maximum variation purposive sampling to identify individuals that would provide a balanced representation.[21-23] Participants included program directors from different specialties and health care professionals from different backgrounds. Semi-structured interview guides were designed to follow a broad, pre-determined line of inquiry that was flexible and that could evolve as data collection unfolded, permitting exploration of emerging themes. Interview guides were created by an interdisciplinary team of investigators with expertise in medical education, simulation, sociological and qualitative research methods. Interviews lasted from forty-five to sixty minutes, were audio-recorded, and transcribed verbatim. (See Appendix S1, online for interview guides).

Qualitative data analysis of the comprehensive data set included the application of inductive coding techniques and the use of the NVIVO software for data management.[21,24] The research team followed Creswell's coding process where data is first explored to gain a general sense of the data and then coded. These codes were described and collapsed into themes.[21] The analysis team consisted of 3 researchers who

participated in coding training and meetings to develop the codebook. The three researchers generated codes (from the same interview transcripts) independently. Then, they engaged in consensus discussions. Inter-rater reliability, assessed prior to independent coding, demonstrated a 95.73% agreement and a 0.75 Kappa score which is considered to be substantial agreement.[25] The volunteer construct was further explored and coded, through a more focused analytic approach in order to gain an in-depth understanding of volunteer engagement.[26] In an iterative process, additional interviews were performed to reach saturation of the subthemes specific to volunteer engagement. This study was granted an official exemption by The Ottawa Hospital Research Ethics Board.

Results

For the larger study (quality improvement initiative of the ACES program) 15 interviews were performed to gain a broad and comprehensive understanding of the ACES program, which included program directors and health care professionals across Canada; physicians (n=11), nurses (n=2) and RTs (n=2) (interview guide 1). Upon analysis of this interview data the 'physician as volunteer' theme was identified. To further explore this finding, and achieve thematic saturation (qualitative) we performed an additional 15 interviews of physician volunteers (interview guide 2). Overall, thirty of thirty-three invited individuals agreed to participate in the semi-structured interviews for a response rate of 91%. All physician volunteers that were interviewed were full time clinicians and members part of the ACES faculty, who are called to participate as needed. Participants are displayed in Table 1.

<Insert Table 1 about here>

To gain an in-depth understanding of the phenomenon of volunteer engagement, the data set was coded and 11 themes were identified and sub-coded. Of these themes, six interrelated themes – volunteer recruitment, volunteer retention, volunteer exchange, volunteer recognition, educator network, and quasi-volunteerism were most prominent in our data. A summary of the qualitative findings is presented in Table 2. Prototypical quotes are provided to elucidate each theme.

<Insert Table 2 about here>

Volunteer Recruitment

Word of Mouth. All recruitment was accomplished through word of mouth. That is, the cue to action was uniformly described by volunteers as an informal interaction with another volunteer, usually a leader who would call the volunteers to request their involvement.

> I just got a call from him [ACES Director] one day, he introduced himself and talked about this program where a few guys were getting together and trying to do this thing and at that time there were, I don't know, about 6 or 7 guys and he asked if I wanted to be part of it.

Snowball Approach. A snowball approach was described by participants as a means of identifying and recruiting high quality volunteers.

> What I would do is have more than one person get in touch with the person they are trying to recruit. First of all you want to cherry pick the people you want to recruit. It's just like a draft in sports or something. You want to cherry pick the

> people you want on your team and once you've earmarked certain people and say, "this person is not just strong clinically but also has great personal skills, is humble enough to listen to feedback, and to not get offended by it but to work with it."

Career Stage. Participants explored the different career stages of physicians who are recruited to volunteer with the program and felt that younger physicians are generally easier to recruit.

> If it was in the middle part of their [physician] career, they may be on a certain track and it's difficult to engage them. I think it would be great if we could recruit people at mid-career because they have a bit more experience, a bit more knowledge about how things should work or how things should flow. On the other hand, if you recruit younger people, I think they are more enthusiastic and have completely new ideas and that's not a bad thing either right? For me, it was great to be involved early on but I was definitely a little shy to come forward with suggestions initially because, yeah, it's just a very established crowd.

Barriers. The main barriers to recruitment included career trajectory (as described above) and individual time constraints, including both personal and professional demands. These barriers also pertained to the retention of volunteers. As volunteer physicians continue along their career they may choose different pursuits (e.g., research) and then do not have time to remain an ACES volunteer.

Volunteer Retention

Distributed Leadership and Career Paths. The organization embraces an open culture creating a collaborative environment, which allows for new leaders to be brought in and mentored by long standing leaders. This relationship enables long-standing leaders to remain involved with the program while balancing other career demands. In this way, ACES is able to deepen its leadership base by distributing responsibilities to others.

> I have decreased in participation, though I still remain section chair, well it is more of a co-chair position because I have a capable colleague who has taken

> over some of the curriculum development…I don't see myself in this role for perpetuity and so it's a good opportunity for people to transition and I think it's part of the natural transition process. I still remain involved and committed to being part of the National ACES Program and I still assist locally but I have decreased my involvement. It is more of a career choice and balancing the different aspects of my career that I've taken on as well.

Program Change and Evolution. The program's continual growth, ongoing modifications and innovative nature were described by volunteers as being very intellectually stimulating. This cognitive component was described by many participants as a major contributor to their initial and ongoing commitment and involvement with the program.

> I think the fact that we change and we grow is very important. If it was just the same program every year it will eventually become stagnant and people will lose interest.

Comfort Zone. Comfort zone is indicative of a behavioral state within which a person operates in an 'anxiety neutral' condition. The objective is to push or lead individuals beyond their comfort zone until comfort is achieved, which enables a consistent high-level performance.[27,28] During their interviews volunteers were asked if they felt they were drawn to more challenging tasks. One physician put it like this,

> So, why is it that you have to get out of your comfort zone? Why do you have to embark on a new mission or path that is quite challenging, one that there is no guarantee that it is going to work? I actually enjoy the process. I love working with others, I love creating things, and I love taking something that's just in the idea stage, and you know transforming it into something that's actually real.

Reciprocal Engagement. Participants identified that a volunteer can enhance another volunteer's engagement and this process is cyclical. Participants further identified that interacting and connecting with students further enhanced their overall engagement.

> It's amazing to go [to the ACES course] and see all these people giving their time because they love to teach and want people to do better. They are genuinely interested in the well-being of these fellows to be better doctors and it's catching

you can't help but get your love of education back.

> When you see other people grow, you grow with it. You grow in parallel, and in fact, it helps you become a better person. It's wonderful to see someone when they start young with enthusiasm, intelligence. These things are the raw materials, you know. And, this person blossoms and becomes a great researcher, and someone who has a great future…that is an incredible reward and it motivates you.

Intrinsic Motivation. We use the psychological lens of motivation to underpin our understanding of intrinsic motivation. There is a fundamental distinction between actions that are self-determined and those that are controlled.[29,30] The former, which reflects an individual's personal attributes and internal (intrinsic) motivation, was identified as contributing to the volunteers' participation in the program. The answer might be as simple as, 'I was built like that. This is who I am'. In fact, many described a strong internal drive to participate, hoping that they 'would be called' to action more frequently to perform tasks for the organization. One participant described his experience like sitting on the bench waiting for the coach to call:

> I guess one of the biggest things as a volunteer, you're always somebody who is kind of on the bench and the coach may call you into play at any time. And, you kind of wonder if you're gonna get called off the bench to play…I love it and I love being invited back each time.

Learners. Fellows, often referred to as high-level learners by the volunteers, served as catalysts for both emotional and cognitive engagement in the ACES program. Some volunteers expressed the gratification they felt in teaching the next generation of intensivists, while others expressed the fulfillment in teaching such advanced learners:

> It's gratifying to feel like you are teaching the next generation of docs as they come through and they are high level learners who are about to become intensivists themselves so they are keen to learn.

> I do enjoy interacting with the students, they are usually a pretty neat group of people. It's sort of the highest level of teaching you get to do. It's neat to have

such advanced learners to teach to.

Volunteer Exchange

Career Opportunities. We use volunteer exchange from the theory of social exchange which posits that social behavior is the result of an exchange process.[31] Volunteers noted that aside from receiving continuing medical education (CME) credit for their volunteerism, their participation in the ACES course provided additional benefits for their careers:

> Being an ACES volunteer means that this is Royal College (RC) accredited and I think that speaks a lot to the quality of the course but also for an academic person who might have additional interests in teaching more RC courses, this work stands out quite a bit.

Keeping Current. Volunteering in the ACES course gave individuals the benefit of staying current at a national level. This knowledge acquisition and networking opportunity both enhanced an individual's practice personally and professionally.

> It's a good group of people, so it's always a good time and it's a way to keep your finger on the pulse of how things are going nationally and talk to people about what is going on in other centers.

Academic Currency. The benefit of volunteering in the course was viewed by many individuals in terms of professional value whereby the experience counts towards promotion and tenure at an academic institution.

> It's always something you can list in your own CV within our medical practice plan. Teaching at these things counts in terms of academic points, you can put down each year that you taught this and that has academic currency.

Volunteer Recognition

Personal Recognition. Attainment value, such that involvement of volunteers with the program confirmed aspects of one's self "this is who I am," was further described in the

form of personal recognition of their role as educators, by colleagues at other universities, across the country.

Scholarly/Academic Work. Volunteers want their work in the ACES program to be recognized as scholarly contributions. The ACES program leadership sends letters of recognition to volunteers' department heads, however, participants described difficulty in getting universities to recognize ACES contributions as scholarly.

> Our impression is that physicians from academic centers are willing to work…to do quite a bit of work as a volunteer provided that their work is considered scholarly work.

> I think ACES does a very good job at recognizing our contributions. They catalogue and document the contributions on an annual basis, they send letters to our Department heads so they recognize us. I think the greater impact is to have an opportunity to enhance this recognition as scholarly work, to meet the criteria for standard publication in a peer review outlet.

Educator Network

Common Vision. Personal perceptions of the importance of the volunteer work coupled with a common vision, passion for education and collaborative spirit was described by participants. At the highest level the penultimate goal of potentially impacting patient care as an outcome was described by both leaders and volunteers. The potential effect on patient care (utility value) was further described as being achievable through the volunteers' abilities and opportunity to help the residents acquire the knowledge and skills required to excel in the clinical setting.

> I think we share a common vision, a common passion. We all believe in education, I think that through collaboration we can do greater things than we could independently. There's a sense of satisfaction of doing it.

Duration of Participation/Loyalty. Participants expressed feelings of loyalty to other volunteers in the network, especially those who have been involved for a longer duration.

> I think there's always going to be some loyalty because you've invested a great period of time. Also, it is one of the few tangible creations that you've helped develop and so you feel part of it.

Affect. Deep and meaningful emotional components connecting volunteers to the ACES program educator network were identified. Being part of a network elicited strong positive emotions. The enjoyment experienced by volunteers was strongly linked to interactions with other like-minded educators. The face-to-face interaction of volunteers on an annual basis at varying Canadian locations was described as an essential part of the organization.

> You feed off the energy of the others, and they feed off your energy…it is a fantastic success component. There was one person who organized the initial think tank but he kind of tied the whole thing together…like molding clay into a form but the clay consisted of a whole bunch of people with lots of ideas…one of the key components has to be the involvement of people who love it and like to think outside the box because as soon as you do that, you have a recipe for success.

> Being a part of this network is intellectually very pleasing, it's emotionally rewarding. You end up feeling like you are part of this community. As a physician, you end up being a better physician because you are learning things from others that you can apply at the bedside.

> When we meet it's like a bunch of friends getting together…everybody is full of energy when you arrive…everybody is happy, people are smiling…and you are basically like a big family…It's mostly, I think, emotional at that stage.

Quasi Volunteerism

Academic Pressure. The terms Quasi volunteer is reflected in both extrinsic and intrinsic motivations to extend effort into a relationship and/or activity. That is, volunteers in academic teaching hospitals described 'academic pressures', especially for younger doctors, where they felt they were required to meet specific academic expectations:

> The premise that its volunteerism is somewhat true. Nobody has a gun to my

> head saying I have to do it but we all have to do something, academically. So, I guess it's quasi-volunteerism. Like if I wasn't doing this I would have to, especially us younger docs, like we are all on some degree of academic pressure to keep the university happy. So, if I were not doing this teaching, I'd be doing something else, you know?

Curriculum Vitae. Intrinsically, participant volunteers used the teaching exposure at the national ACES course to grow their own CVs. As such, for some, the volunteer activities were not performed for purely altruistic reasons, but also for professional gain:

> It's good to have in your career, you have to have exposure to teaching outside of your center so this gives me the opportunity to fulfill that, so it's not all altruistic. it's something that I do need to do for my curriculum vitae.

Discussion

The productivity, success, and sustainability of the ACES organization depends on the recruitment, retention and recognition of volunteers in a collaborative network. As depicted in our conceptual framework, the synergistic effects of the individual's emotional and cognitive engagement along with reciprocal engagement within the environmental context and culture of the organization, followed by a cue to action, leads to the volunteers behavioural engagement in volunteer activities. This behavioural engagement of the volunteers leads to the output of contribution to the ACES program.

Our study yields several key findings that contribute to our understanding of what motivates physicians to volunteer, and perhaps more importantly what sustains their volunteerism. With respect to recruitment, we found that word-of-mouth recruitment was the primary vehicle to engage new members. In the marketing literature, word-of-mouth is defined as an interpersonal communication, independent of the organization's marketing activities, about an organization or its products.[32] Our findings support this

literature in that word-of-mouth is a dyadic communication between a source and a recipient.[33] This implies that the occurrence of word-of-mouth is determined by characteristics of the recipient, the characteristics of the source, and their mutual relationship.[34,35]

Word-of-mouth communication was found to be particularly effective in securing buy-in from new members when done early in the recruitment phase. That is, a phone call from one of the long-standing members of ACES early in the selection phase was conducted so as to "feel out" potential new members. This also tended to have the effect in attracting the potential recruit. This supports earlier research that demonstrated that receiving positive information through word-of-mouth early in the recruitment process is positively related to perceived organizational attractiveness and actual recruitment.[36] Within the business literature, this phenomenon is called the accessibility-diagnosticity model. The model suggests that information provided through word-of-mouth affects potential recruits' early evaluations of the organization because of its accessibility in memory and its feedback potential.[37,38] That is, if a physician receives positive word-of-mouth information on a given program or organization they are more likely to think favourably when asked at a later date to perform a volunteer activity. This finding has clear practical implications for practice in that organizations should try to stimulate positive word-of-mouth early in the recruitment process because of its positive impact on potential recruits attraction to an organization and subsequent retention.

Long-standing ACES volunteers take careful measures to select, and subsequently recruit new members. In turn, this recruitment effort has a significant impact on long-term retention. The majority of physicians recruited become committed to the ACES program and have long-term sustainability as volunteers. We have found that a key to this commitment and sustainability lies in the embeddedness of the social networks among volunteer physicians. Research on teams in which dyads are found within larger groups of people (e.g., ACES volunteer physicians within the larger medical community) suggests that people are likely to collaborate with others who possess qualities and skills, and know-how that are complementary to their own and relevant to reaching a particular objective.[39] Interestingly, we found that many of the new recruits were already well known to at least several of the ACES physician volunteers, and thus were already in their educator network. This supports the notion that people are inclined to create relationships with friends of their friends (or the business associates of their business associates). The effect of sharing mutual acquaintances on attachment appears to be additive in that each additional mutual acquaintance shared by an unconnected dyad (relationship) additionally increased the likelihood that they will become acquainted.[40] Perhaps the reason for the excellent retention and deep commitment of ACES physician volunteers is explained by the structure of the ACES social networks which comprises many third party connections. Research states that ties connecting people who share several common third party connections are more likely to withstand the test of time.[41,42] As related to our conceptual framework, we understand that physician volunteers exercise both emotional (intrinsic commitment & loyalty) and cognitive (intellectual challenge & constant change/growth) engagement that directly relate to the retention of volunteers.

Our study has shown that financial incentives are of low to absent value to physician volunteer engagement in all activities within the ACES program. The emotional and cognitive rewards coupled with reciprocal engagement were key elements. In addition, the organizational culture provided the basis for successful engagement. The need to enhance scholarly recognition was identified. Literature supports that the internal motivation is a strong driver of volunteer teacher participation.[9] The high value placed on personal satisfaction appears to be consistent across a variety of contexts. This domain of personal satisfaction can be further broken down into the emotional, cognitive and reciprocal form of engagement and mapped to our conceptual framework. In particular, physicians felt a strong sense of cognitive engagement with regard to being 'pushed' out of their comfort zone so as to reach a new and expanded state of performance.

We found workload and increased external demands to be a threat to physician volunteer activities. Yet, in the ACES group we identified healthcare professionals that have remained engaged despite considerable external demands. In fact most volunteers in this program would contribute further if called upon. The high level of engagement of these individuals is complex and involves many elements of the conceptual framework. In some circumstances, when other demands increased, volunteers modified their role and mentored new leaders, allowing for ongoing engagement. Moving away from traditional 'individual' leadership theories, team leadership theory includes the concept of team leadership capacity, which includes the entire range of the team's leadership.[43] It appears

that the ACES organizational structure has capitalized on this distributed shared leadership approach to ensure sustainable and diversity of available leaders.

Limitations

There are several limitations to our study. It was a cross-sectional study, performed in a single context of highly engaged health care professionals most of whom were located at academic teaching hospitals. The nature of engagement within the organization may be context specific. Further studies are required to determine the transferability our findings to other contexts. In our study we sought perspectives from volunteers performing various tasks. However, given the sample size it is not possible to determine if the underlying components of engagement change with variation in the roles. Further, we did not examine the time spent volunteering (e.g., hours/weeks per year) nor did we seek out individuals who may have volunteered but later completely withdrew. We will ensure to capture this data in our future work. Finally, when the volunteer role includes teaching, we identified that the reciprocal engagement between the student and teacher adds to the overall engagement of the volunteer. This component was not in our conceptual framework and could be added in future investigations where the volunteer role includes teaching.

Future Research

The presumption that engagement is malleable is an exciting prospect.[44,45] A cohesive framework is required to facilitate understanding of the complex construct of volunteer physician engagement and this framework can be utilized in the development of

multifaceted approaches to enhance volunteer physician engagement. For example, an intervention may include enhancing reciprocal engagement through collaborative meetings and enhancing interpersonal relationships; emotional engagement by connecting with individuals on a deeper level with respect to the meaning and potential outcomes of their work; cognitive engagement by including intellectually challenging tasks, and recognition of the volunteers work through faculty appointment, newsletters among their peers, awards and scholarly acknowledgement. Further research is also required to determine how we measure engagement. The conceptual framework presented in this paper may aid in the design of measurement tools. The strategies and tools may vary depending on type of volunteer activity and setting. Furthermore, research is required to explore the construct of disengagement, and also to determine if different professional "identities," such as nurses, respiratory therapists, administrators, have different facilitators and inhibitors to engagement.

Conclusion

Volunteer physicians are essential to the growth and sustainability of the ACES program. This organization has demonstrated great success with engaging highly effective volunteers. Our conceptual framework and qualitative findings provide a preliminary framework as an important initial step in understanding the complex construct of volunteer physician engagement. This study will guide us in our development of a multifaceted intervention, aligned with the conceptual framework, to enhance volunteer physician engagement within the organization. Finally, given the current economic

climate, providing compensation may not be financially feasible or sustainable so alternative approaches must be explored to engage volunteer physicians.

Contributors: Dr. Sarti and Dr. Sutherland had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
Study concept and design: Sarti, Sutherland, Landriault, DesRosier, Brien, Cardinal
Acquisition of data: Sarti, Sutherland, Landriault, DesRosier
Analysis and interpretation of data: Sarti, Sutherland, Landriault, Cardinal
Drafting of the manuscript: Sarti and Sutherland
Critical revision of the manuscript for important intellectual content: Sarti, Sutherland, Landriault, DesRosier, Brien, Cardinal
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List of Figures:

List of Tables:

List of Supplemental Online Content

Appendix S1. Interview Guides.

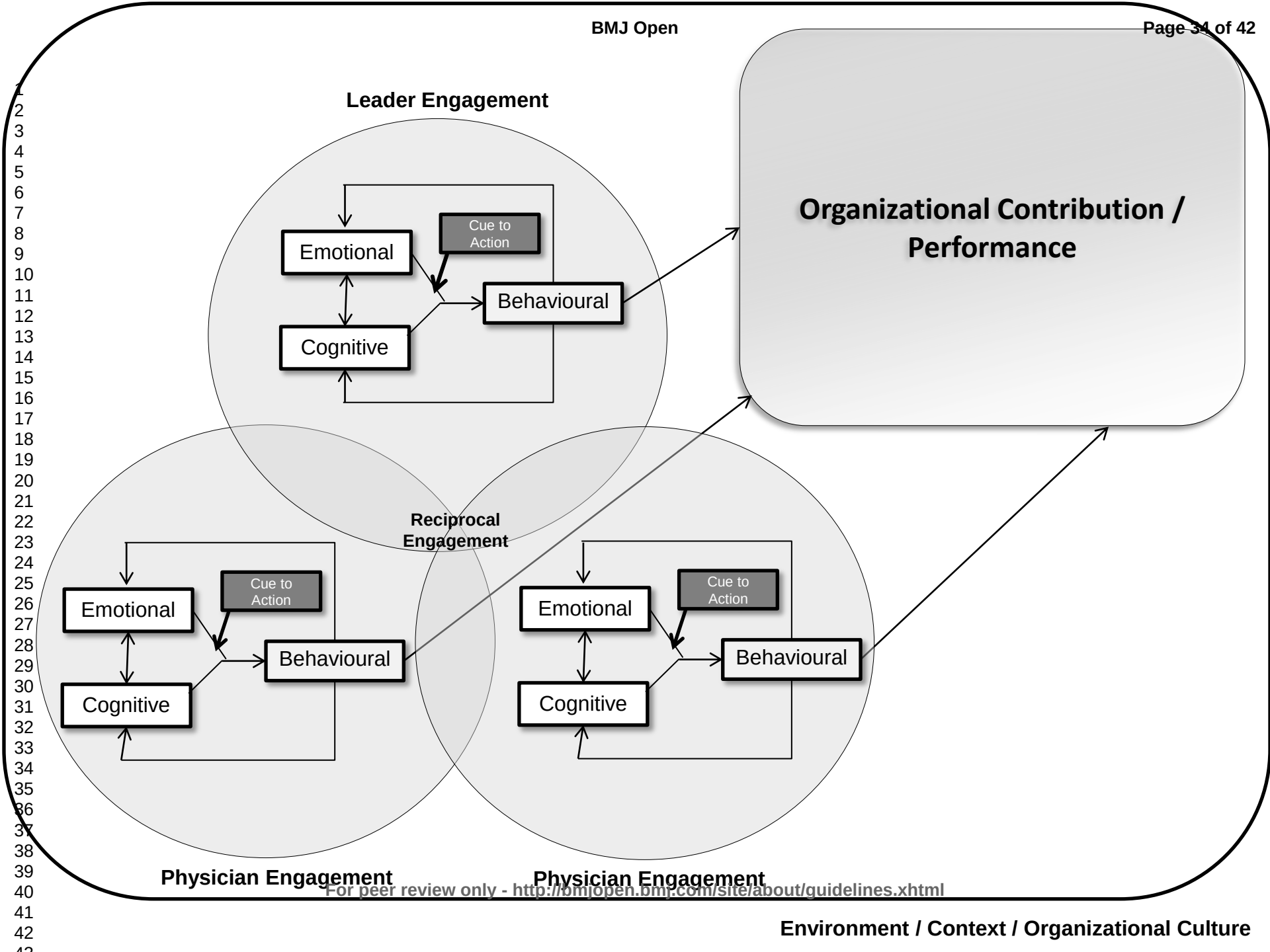

Table 1. Characteristics of interview participants.

Characteristic	n	%
Number	30	
Region *		
Mountain	7	23
Prairies	3	10
Ontario	14	47
Quebec	2	7
Atlantic	4	13
Specialty/Discipline **		
Critical Care	23	77
Anesthesia	7	23
Internal Medicine	5	17
Surgery	3	10
Family Medicine	3	10
Nurses	2	7
Respiratory Therapists	2	7
Pediatric Critical Care	1	3

** The regions of Canada have been divided in the following way: Mountain includes British Columbia and Alberta; Prairies include Saskatchewan and Manitoba; Atlantic includes all Atlantic Provinces.*
*** Individuals were classified under their current practice specialties. Note that an individual may be practicing in more than one specialty.*

Table 2: Summary of the qualitative findings.

1. Volunteer Recruitment
a. Word of mouth b. Snowball approach c. Career stage d. Barriers
2. Volunteer Retention
a. Distributed leadership and career paths b. Program change and evolution/innovation c. Comfort zone d. Reciprocal engagement e. Intrinsic motivation f. Learners
3. Volunteer Exchange
a. Career opportunities b. Keep current c. Academic currency
4. Volunteer Recognition
a. Personal recognition b. Scholarly/academic work
5. Educator Network
a. Common vision b. Duration or participation/loyalty c. Affect
6. Quasi Volunteerism
a. Academic pressure b. Curriculum vitae

Interview Guide 1

Introduction

1. Introduction
   Thanks for agreeing to participate … We are conducting a needs assessment for the ACES course (introduce the project). Consent.

2. Background
   a. Goal of the ACES course - provide the learner with the necessary knowledge, skills and attitude to recognize and manage a patient who is acutely and critically ill in the first hour of presentation
   b. Modality of the ACES course - multimodal: e-learning, book, case seminars, technical skill workshop, simulation, and bedside tools
3. Purpose of the needs assessment
   a. Interest expressed by various groups to customize the ACES course to a specific population
   b. Facilitate the dissemination of the course across Canada
   c. Exploring interest in an interprofessional course
   d. Explore business models that would facilitate dissemination
   e. Explore peer-review process and means of promoting academic contributions of faculty
4. Please let us know if you are NOT in a position to answer some of the questions (e.g. vice-dean discussing weaknesses of residents during resuscitation)
5. Interview will be recorded; all information will be kept confidential

Demographics

1. What is your professional designation?
2. What are your current roles?
3. Can you let me know what type of institution you work in (Community Hospital, Secondary, Tertiary, and Quaternary)?
4. When it comes to responding to a crisis, what is the usual makeup of the team in your institution?
5. Are you familiar with the ACES course? Have you participated or taught an ACES course?

Content

1. When it comes to responding to a crisis, what are the team's strengths?
2. When it comes to responding to a crisis, what are team's weaknesses?
3. Probes
   a. What about (mention any members of the team that have not been addressed)

4. At the end of the course, the learner should be able to…….. (Please list the 5 most important performance objectives)
5. Is there anything else that you can think of that we have not discussed?

Course format

1. Do you think that pre-course on-line content would be useful?
    a. Do you anticipate that you or your learners may have any problems accessing online material?
    b. What is the purpose of having pre-course on-line content?
        i. Teaching knowledge, decision-making, other?
        ii. Preparation for the face-to-face course
        iii. Assessment of learners?
        iv. Others
    c. What should be the duration of a pre-course on-line session?
    d. Should the pre-course on-line content be mandatory?
        i. If so, can you think of ways to ensure your or your learners compliance with mandatory online content?

2. Do you think that post-course on-line content would be useful?
    a. Would it be useful for you to have access to the pre-course on-line content after the course for further revision? How long?
    b. What is the purpose of having post-course on-line content?
        i. Teaching knowledge, decision-making, other?
        ii. Preparation for the face-to-face course
        iii. Assessment of learners?
        iv. Post-course assessment of knowledge retention
        v. Others
    c. What should be the duration of an on-line session?
        i. Post face-to-face course
    d. Should post-course on-line content be mandatory?
        i. If so, can you think of ways to ensure your or your learners compliance with mandatory online content?

3. Do you think that the program should have a face-to-face course?
    a. How long should the course be?
    b. What should be the preferred modalities?
        a. Simulation?
        b. Case-based seminars?
        c. Technical skills workshops?
        d. Didactic lecture?

e. Other?

c. What should be the relative proportion of time spent for each modality?
    a. Simulation?
    b. Case-based seminars?
    c. Technical skills workshops?
    d. Didactic lecture?
    e. Other?
d. Should the pre-course material be reviewed during the face-to-face course?
e. What should determine the instructor to participant ratio?
    a. Simulation?
    b. Case-based seminars?
    c. Technical skills workshops?
    d. Didactic lecture?
    e. Other?
f. Tell me what you think about making this course interprofessional…
    a. What would be the advantages?
    b. What would be the challenges?

4. How complicated is it for your institution/organization to organize a course that contains a large components of simulation training?
    a. Do you have access to simulation laboratory with the required equipment?
    b. Do you have access to simulation engineer
    c. Do you have trained instructors
    d. Do you have course co-coordinators with experience delivering such courses

Market analysis

1. What do you like most about the ACES course?
2. What changes would most improve the ACES course?
3. Do you know of competing courses currently available?
4. What do you like the most about these other courses?
5. What changes would most improve these other courses?
6. If you are not likely to deliver the ACES course, why not?
7. What would make you more likely to deliver the ACES course?
    a. Is costing an issue?
    b. Are difficulties delivering the ACES course an issue?
        i. Low participants to instructor ratio
        ii. Space
        iii. Equipment

iv. Personnel (simulation engineer, trained actors, course coordinator)

8. Imagine that you are tasked to widely disseminate this course in order to improve patient care. Can you think of a business model that would favor wide dissemination?
    a. Keeping in mind that there is a cost related to the development and dissemination of the material.

Peer review process

1. Do you have any suggestions on how to best organize and facilitate the peer-review process?
    a. Initially
    b. On an ongoing process

Recognition

1. How could the Royal College best recognize your or your institution's contributions in the creation and delivery of the ACES course?
    a. Would it help if creators were informed of their material evaluations and extent of dissemination? How often?
    b. Would including the sums invested in the completion of the project be useful as a means of recognition?

Interview Guide 2

Volunteer Engagement in the ACES program

- Target – Leadership within the organization and some Volunteer Physicians
- Introduction, Confidentiality, Consent

Leadership Questions:

1. What is your role in the ACES program?
2. How do volunteers impact the program? Has this changed over the years / history of the program?
3. Who are the volunteers?
4. Where are they located?
5. What roles do volunteers perform?
    a. *Probe – development, delivery, administration, promotion of the program, etc. Specifically link to the conceptual framework*
6. Are there more ways that you envision them being involved?
7. Why do you think physicians volunteer their time with the ACES program?
    a. *Probes: To be completed -*
        i. *Behavioural*
        ii. *Emotional*
        iii. *Cognitive*
            1. *The challenge of the activity? Or mastering challenging / difficult ideas/skills/tasks?*
8. How are they currently recruited?
9. What are the barriers to recruitment and retention of volunteers?
10. What are the facilitators to recruitment and retention of volunteers?
11. How are they rewarded/appreciated for their contribution?
12. How do you see the ACES program evolving and how will this impact the volunteers? Impact the need for volunteers?
13. If a need for more volunteers is identified - Any solutions to increasing capacity and retention?

Questions regarding your volunteer involvement

14. Do you volunteer time with the ACES program?
15. What activities / role do you perform as a volunteer?
16. Why do you volunteer?
17. How is your contribution acknowledged?

Volunteer Questions:

1. What is your role in the ACES program?
2. How long have you been a volunteer with ACES?
3. How did you become involved with ACES?
4. Why do you volunteer?
    a. Probes:
        i. Behavioural
        ii. Emotional
        iii. Cognitive
            1. Do find this work challenging? by the activity and or your involvement? Or mastering challenging / difficult ideas/skills/tasks?
    b. What specifically – ie, what part is challenging? What part do you 'love'? what part are you most 'interested' in?
5. Have you ever considered increasing your involvement with ACES?
6. Have you ever considered decreasing or discontinuing your involvement with ACES?
7. Are there factors that maintain your involvement with ACES?
8. What improvements could be made to better meet your needs as a volunteer with the organization?

BMJ Open

Exploring the components of physician volunteer engagement: a qualitative investigation of a national Canadian simulation based training program

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Keywords:	Physicians, Volunteers, QUALITATIVE RESEARCH, MEDICAL EDUCATION & TRAINING

Exploring the components of physician volunteer engagement: a qualitative investigation of a national Canadian simulation based training program

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Key Words: volunteer, engagement, qualitative research, medical education, critical care

Abstract

Objectives: Conceptual clarity on physician volunteer engagement is lacking in the medical literature. The aim of this study was to present a conceptual framework to describe the elements which influence physician volunteer engagement and to explore volunteer engagement within a national educational program.

Setting: The context for this study was the Acute Critical Events Simulation (ACES) program in Canada, which has successfully evolved into a national educational program, driven by physician volunteers. From 2010 to 2014 the program recruited 73 volunteer health care professionals who contributed to the creation of educational materials and/or served as instructors.

Method: A conceptual framework was constructed based on an extensive literature review and expert consultation. Secondary qualitative analysis was undertaken on fifteen semi-structured interviews conducted from 2012 to 2013 with program directors and health care professionals across Canada. An additional fifteen interviews were conducted in 2015 with physician volunteers to achieve thematic saturation. Data was analyzed iteratively and inductive coding techniques applied.

Results: The majority were physicians. From the physician volunteer data, eleven themes emerged. The most prominent themes included volunteer recruitment, retention, exchange, recognition, educator network, and quasi volunteerism. Captured within these interrelated themes were the framework elements, including the synergistic effects of emotional, cognitive and reciprocal engagement. Behavioural engagement was driven by these factors along with a cue to action, which led to contributions to the ACES program.

Conclusion: This investigation provides a preliminary framework and supportive evidence towards understanding the complex construct of physician volunteer engagement. The need for this research is particularly important in present day, where growing fiscal constraints create challenges for medical education to do more with less.

Article Summary

Strengths and limitations of this study

- First study to synthesize key elements of physician volunteer engagement into a conceptual framework.
- Covers an under-investigated issue and draws upon a wider theoretical background.
- Qualitative data obtained provides new insights into physician volunteer engagement, which may offer practical ideas to improve volunteer engagement strategies.
- Our findings were obtained in one country, within one national program.
- Explored volunteer engagement in a highly engaged group of physicians, study was not able to explore disengagement.

Introduction

Physician volunteers are essential to health care delivery and medical education.[1] Despite the growing need to optimize volunteer physician engagement, there is a paucity of data on how to improve and maintain engagement. Volunteerism can be defined as any altruistic act, which is undertaken without financial gain while engagement has been defined as being "actively committed" or "to involve oneself or become occupied; to participate."[2,3]

Physicians appear to highly value their role as volunteers. In a US study by Gruen et al., 95 % of physicians surveyed rated community participation as important".[4] Yet, in a national survey of 319 physicians, only 39% participated in volunteer activities.[5] Therefore, there appears to be a wide gap between the perceived importance of volunteering and its translation into action or engagement. Such studies illustrate the need to better understand the determinants of physician volunteer engagement and the ways in which it can be optimized.

Most of the medical literature on engagement is centered on the patient and behaviors that promote health. A few isolated studies focusing on physician engagement were identified but there is currently no accepted model describing the multifaceted dimensions of physician volunteer engagement.[6-10] We can draw from the social science literature in order to define and examine the various components of engagement.

The concept of engagement, specifically, school engagement has been synthesized in a review by Fredricks et al.[11] They present engagement as a multifaceted construct including three dynamically interrelated components: behavioural, emotional and cognitive engagement. Behavioural engagement is related specifically to the on task behavior. Emotional engagement is related to the value of the tasks as determined by the individual. Value is further divided into 4 components: "interest (enjoyment of the task), attainment value (importance of doing well on the task for confirming aspects of one's self-schema), utility value (importance of the task for future goals), and cost (negative aspects of engaging in the task)."[11] Cognitive engagement refers to an individual's motivational goals and self-regulated learning. This concept can be further described as a psychological investment in learning, understanding, and mastering knowledge or skills with a "desire to go beyond the requirements, and a preference for challenge."[11]

In this study, we sought to develop a conceptual framework to describe and explore the components and theoretical underpinnings of physician volunteer engagement. We began our investigation with a secondary analysis of a comprehensive needs assessment in a quality improvement initiative aimed at the overall enhancement of the Acute Critical Events Simulation (ACES) program. Later, we extended this initial work by obtaining additional data to provide evidence towards understanding the complex construct of physician volunteer engagement.

Context

The ACES Program is a national educational program aimed at improving the proficiency of individuals and teams involved in the early management of critically ill patients. Nurses, respiratory therapists, and physicians who are the first to respond to a patient in crisis come from various disciplines and practice in diverse milieus. Their experience managing acutely ill patients is often very limited given the low incidence of critical illness. Yet, clinical studies indicate that early recognition and management are most effective in lowering both morbidity and mortality. Randomized controlled trials and guidelines emphasize the importance of the 'golden-hour' in patients with conditions such as myocardial infarction, stroke, and sepsis.[12-17] The ACES program includes various simulation modalities delivered online or face-to-face as well as books and didactic material. It also includes instructor certification courses. Most of the educational materials have been customized to meet the needs of different groups of learners.

This program was initially developed from the vision and efforts of a small collective of Canadian critical care physicians who volunteered their time and expertise. It has successfully evolved into a national educational program, has been acquired by the Royal College of Physicians and Surgeons of Canada (RCPSC), and continues to advance and grow. Volunteers remain fundamental to the ACES program. They create materials, organize courses, teach, and conduct research. From 2010 to 2014 the program recruited a total of 73 volunteers, 69 of whom were physicians. The need for volunteers is increasing due to greater demand, addition of new forms of simulation, growth of online curricula and anticipated movement to a competency-based program.

Method

A conceptual framework was constructed; secondary analysis of the ACES quality improvement initiative data was performed; additional interviews were conducted; qualitative data collection was performed and analyzed iteratively.

Conceptual Framework

A conceptual framework is meant to explain the key factors, constructs, or variables, and their presumed relationships to be studied.[18,19] An extensive literature review along with expert consultation informed the development of the framework. We opted for a more pre-structured qualitative research design as we wanted to bound the study within a set of engagement variables, yet at the same time we needed to maintain enough flexibility to allow for emergent findings so as to better understand the construct of physician engagement. We adapted a student engagement conceptual framework.[11] We found Fredericks et al.'s theory of engagement to be useful in our medical context. In further modifying the conceptual framework we used the 'bins approach,' whereby the framework is mostly a visual catalogue of roles to be studied (e.g., physician leaders and physicians), and within each role, how the variables of engagement influence their actions.[19] A multidisciplinary panel of experts iteratively collaborated on the modifications to the conceptual framework included critical care physicians and leaders, administrators, system-level policymakers and a sociologist.

We developed the model depicted in Figure 1, to explore volunteer physician engagement in a comprehensive manner. For our study, the physician behavior of participation as a

volunteer is the desired outcome. All other elements, which contribute and lead to this behavior are under investigation. In this figure, we have depicted two physicians and one leader for simplicity. In reality there may be many leaders and physicians. We define a leader as an individual within the group who influences others towards a mutual purpose or common goal.[20] We define an individual's engagement as a multidimensional construct including emotional and cognitive engagement which ultimately can lead to behavioral engagement, with tasks directed toward contributing to organizational development and/or a specific domain, such as education, quality and safety, etc.[11]

<insert Figure 1 about here>

An individual's overall engagement is impacted by their demographic and psychosocial characteristics. The emotional and cognitive components drive behavior. The bidirectional arrows between these components indicates that the presence and/or development of one component may impact the other. The behavior itself may further promote the emotional and cognitive components and enhance volunteer behaviors (indicated by the arrow back to the emotional and cognitive components). In addition, the behavior requires a "cue to action" or trigger (which can be either intrinsic or extrinsic to the individual). A simplistic example of an extrinsic "cue to action" may involve the director of the program contacting a volunteer to participate.

Individual volunteers have the potential to impact each other and synergistically enhance one another's engagement.' We have termed this variable "reciprocal engagement." This

is akin to mutual engagement involving not only individual actions/attributes but also the actions/attributes of others.[21] This relationship and enhanced engagement potential is likely secondary to the impact on the individuals' emotional, cognitive and behavioral components and/or may provide a trigger leading to the behavior.

Leaders have their own intrinsic characteristics, emotional and cognitive components which drive the behavior. Reciprocal engagement may also synergistically increase the engagement of both the leader and individuals.

Ultimately, the behavioral engagement of the individual volunteers can lead to increased organizational performance.[22] Sustainability of the volunteers likely depends on these factors being maintained and may fluctuate for an individual over time with periods of greater and lesser engagement, for example based on the presence or absence of a "cue to action" and also based on changes in organizational culture, leadership and other individuals.

Data Collection and Analysis

As part of a quality improvement initiative of the ACES program, interviews were conducted between 2012 to 2013. Participant selection was carried out using maximum variation purposive sampling to identify individuals that would provide a balanced representation.[23-25] Participants included program directors from different specialties and health care professionals from different backgrounds. Upon analysis of this interview data the 'physician as volunteer' theme was identified. To further explore this finding,

and achieve thematic saturation we performed additional interviews with physician volunteers in 2015.

Semi-structured interview guides were designed to follow a broad, pre-determined line of inquiry that was flexible and that could evolve as data collection unfolded, permitting exploration of emerging themes. Interview guides were created by an interdisciplinary team of investigators with expertise in medical education, simulation, sociological and qualitative research methods. Interviews lasted from forty-five to sixty minutes, were audio-recorded, and transcribed verbatim. (See Appendix S1, online for interview guides).

Qualitative data analysis of the comprehensive data set included the application of inductive coding techniques, utilizing thematic content analysis, and NVIVO software for data management.[19,23] The research team followed Creswell's coding process where data is first explored to gain a general sense of the data and then coded. These codes were described and collapsed into themes.[23] The analysis team consisted of 3 researchers who participated in coding training and meetings to develop the codebook. The three researchers generated codes (from the same interview transcripts) independently. Then, they engaged in consensus discussions. Inter-rater reliability, assessed prior to independent coding, demonstrated a 95.73% agreement and a 0.75 Kappa score which is considered to be substantial agreement.[26] The volunteer construct was further explored and coded, through a more focused analytic approach in order to gain an in-depth understanding of volunteer engagement.[27] In an iterative process, additional interviews

were performed to reach saturation of the subthemes specific to volunteer engagement. This study was granted an official exemption by The Ottawa Hospital Research Ethics Board.

Results

For the larger study (quality improvement initiative of the ACES program) 15 interviews were performed to gain a broad and comprehensive understanding of the ACES program, which included program directors and health care professionals across Canada; physicians (n=11), nurses (n=2) and RTs (n=2) (interview guide 1). An additional 15 interviews of physician volunteers were performed (interview guide 2). Overall, thirty of thirty-three invited individuals agreed to participate in the semi-structured interviews for a response rate of 91%. All physician volunteers that were interviewed were full time clinicians and members of the ACES faculty, who are called to participate as needed. Participants are displayed in Table 1.

Table 1. Characteristics of interview participants.

Characteristic	n	%
Number	30	
Region *		
Mountain	7	23
Prairies	3	10
Ontario	14	47
Quebec	2	7
Atlantic	4	13
Specialty/Discipline **		
Critical Care	23	77
Anesthesia	7	23
Internal Medicine	5	17
Surgery	3	10
Family Medicine	3	10

Nurses	2	7
Respiratory Therapists	2	7
Pediatric Critical Care	1	3

** The regions of Canada have been divided in the following way: Mountain includes British Columbia and Alberta; Prairies include Saskatchewan and Manitoba; Atlantic includes all Atlantic Provinces.*
*** Individuals were classified under their current practice specialties. Note that an individual may be practicing in more than one specialty.*

To gain an in-depth understanding of the phenomenon of volunteer engagement, the data set was coded and 11 themes were identified and sub-coded. Of these themes, six interrelated themes – volunteer recruitment, volunteer retention, volunteer exchange, volunteer recognition, educator network, and quasi-volunteerism were most prominent in our data. A summary of the qualitative findings is presented in Table 2. Prototypical quotes are provided to elucidate each theme.

Table 2: Summary of the qualitative findings.

1. Volunteer Recruitment
a. Word of mouth
b. Snowball approach
c. Career stage
2. Volunteer Retention
a. Distributed leadership and career paths
b. Program change and evolution/innovation
c. Comfort zone
d. Reciprocal engagement
e. Intrinsic motivation
f. Learners
g. Barriers
3. Volunteer Exchange
a. Career opportunities
b. Keep current
c. Academic currency
4. Volunteer Recognition
a. Personal recognition
b. Scholarly/academic work
5. Educator Network

a. Common vision b. Duration or participation/loyalty c. Affect
6. Quasi Volunteerism
a. Academic pressure b. Curriculum vitae

Volunteer Recruitment

Word of Mouth. All recruitment was accomplished through word of mouth. That is, the cue to action was uniformly described by volunteers as an informal interaction with another volunteer, usually a leader who would call the volunteers to request their involvement.

> I just got a call from him [ACES Director] one day, he introduced himself and talked about this program where a few guys were getting together and trying to do this thing and at that time there were, I don't know, about 6 or 7 guys and he asked if I wanted to be part of it.

Snowball Approach. A snowball approach was described by participants as a means of identifying and recruiting high quality volunteers. With this approach, leaders would contact volunteers within the group, who in turn would reach out to contacts in their social networks to identify potential new recruits who have the qualities required to contribute to the group.

> What I would do is have more than one person get in touch with the person they are trying to recruit. First of all you want to cherry pick the people you want to recruit. It's just like a draft in sports or something. You want to cherry pick the people you want on your team and once you've earmarked certain people and say, "this person is not just strong clinically but also has great personal skills, is humble enough to listen to feedback, and to not get offended by it but to work with it."

Career Stage. Participants explored the different career stages of physicians who are recruited to volunteer with the program and felt that younger physicians are generally easier to recruit.

> If it was in the middle part of their [physician] career, they may be on a certain track and it's difficult to engage them. I think it would be great if we could recruit people at mid-career because they have a bit more experience, a bit more knowledge about how things should work or how things should flow. On the other hand, if you recruit younger people, I think they are more enthusiastic and have completely new ideas and that's not a bad thing either right? For me, it was great to be involved early on but I was definitely a little shy to come forward with suggestions initially because, yeah, it's just a very established crowd.

Volunteer Retention

Distributed Leadership and Career Paths. The organization embraces an open culture creating a collaborative environment, which allows for new leaders to be brought in and mentored by long standing leaders. This relationship enables long-standing leaders to remain involved with the program while balancing other career demands. In this way, ACES is able to deepen its leadership base by distributing responsibilities to others.

> I have decreased in participation, though I still remain section chair, well it is more of a co-chair position because I have a capable colleague who has taken over some of the curriculum development…I don't see myself in this role for perpetuity and so it's a good opportunity for people to transition and I think it's part of the natural transition process. I still remain involved and committed to being part of the National ACES Program and I still assist locally but I have decreased my involvement. It is more of a career choice and balancing the different aspects of my career that I've taken on as well.

Program Change and Evolution. The program's continual growth, ongoing modifications and innovative nature were described by volunteers as being very intellectually stimulating. This cognitive component was described by many participants as a major contributor to their initial and ongoing commitment and involvement with the program.

> I think the fact that we change and we grow is very important. If it was just the same program every year it will eventually become stagnant and people will lose interest.

Comfort Zone. Comfort zone is indicative of a behavioral state within which a person operates in an 'anxiety neutral' condition. The objective is to push or lead individuals beyond their comfort zone until comfort is achieved, which enables a consistent high-level performance.[28,29] During their interviews volunteers were asked if they felt they were drawn to more challenging tasks. One physician put it like this,

> So, why is it that you have to get out of your comfort zone? Why do you have to embark on a new mission or path that is quite challenging, one that there is no guarantee that it is going to work? I actually enjoy the process. I love working with others, I love creating things, and I love taking something that's just in the idea stage, and you know transforming it into something that's actually real.

Reciprocal Engagement. Participants identified that a volunteer can enhance another volunteer's engagement and this process is cyclical. Participants further identified that interacting and connecting with students further enhanced their overall engagement.

> It's amazing to go [to the ACES course] and see all these people giving their time because they love to teach and want people to do better. They are genuinely interested in the well-being of these fellows to be better doctors and it's catching you can't help but get your love of education back.

Intrinsic Motivation. We use the psychological lens of motivation to underpin our understanding of intrinsic motivation. There is a fundamental distinction between actions that are self-determined and those that are controlled.[30,31] The former, which reflects an individual's personal attributes and internal (intrinsic) motivation, was identified as contributing to the volunteers' participation in the program. The answer might be as simple as, 'I was built like that. This is who I am'. In fact, many described a strong internal drive to participate, hoping that they 'would be called' to action more frequently

to perform tasks for the organization. One participant described his experience like sitting on the bench waiting for the coach to call:

> I guess one of the biggest things as a volunteer, you're always somebody who is kind of on the bench and the coach may call you into play at any time. And, you kind of wonder if you're gonna get called off the bench to play…I love it and I love being invited back each time.

Learners. Fellows, often referred to as high-level learners by the volunteers, served as catalysts for both emotional and cognitive engagement in the ACES program. Some volunteers expressed the gratification they felt in teaching the next generation of intensivists, while others expressed the fulfillment in teaching such advanced learners:

> It's gratifying to feel like you are teaching the next generation of docs as they come through and they are high level learners who are about to become intensivists themselves so they are keen to learn.

Barriers. The main barriers to retention included career trajectory (as described above) and individual time constraints, including both personal and professional demands. As volunteer physicians continue along their career they may choose different pursuits (e.g., research) and then do not have time to remain an ACES volunteer.

Volunteer Exchange

Career Opportunities. We use volunteer exchange from the theory of social exchange which posits that social behavior is the result of an exchange process.[32] Volunteers noted that aside from receiving continuing medical education (CME) credit for their volunteerism, their participation in the ACES course provided additional benefits for their careers:

> Being an ACES volunteer means that this is Royal College (RC) accredited and I think that speaks a lot to the quality of the course but also for an academic person who might have additional interests in teaching more RC courses, this work

stands out quite a bit.

Keeping Current. Volunteering in the ACES course gave individuals the benefit of staying current at a national level. This knowledge acquisition and networking opportunity both enhanced an individual's practice personally and professionally.

> It's a good group of people, so it's always a good time and it's a way to keep your finger on the pulse of how things are going nationally and talk to people about what is going on in other centers.

Academic Currency. The benefit of volunteering in the course was viewed by many individuals in terms of professional value whereby the experience counts towards promotion and tenure at an academic institution.

> It's always something you can list in your own CV within our medical practice plan. Teaching at these things counts in terms of academic points, you can put down each year that you taught this and that has academic currency.

Contributing to another's program was further described as a method of building up ones currency in that there was an expectation that, in turn, volunteer peers would "pay back" the favor at a later date.

Volunteer Recognition

Personal Recognition. Attainment value, such that involvement of volunteers with the program confirmed aspects of one's self "this is who I am," was further described in the form of personal recognition of their role as educators, by colleagues at other universities, across the country.

Scholarly/Academic Work. Volunteers want their work in the ACES program to be recognized as scholarly contributions. The ACES program leadership sends letters of

recognition to volunteers' department heads, however, participants described difficulty in getting universities to recognize ACES contributions as scholarly.

> I think ACES does a very good job at recognizing our contributions. They catalogue and document the contributions on an annual basis, they send letters to our Department heads so they recognize us. I think the greater impact is to have an opportunity to enhance this recognition as scholarly work, to meet the criteria for standard publication in a peer review outlet.

Educator Network

Common Vision. Personal perceptions of the importance of the volunteer work coupled with a common vision, passion for education and collaborative spirit was described by participants. At the highest level the penultimate goal of potentially impacting patient care as an outcome was described by both leaders and volunteers. The potential effect on patient care (utility value) was further described as being achievable through the volunteers' abilities and opportunity to help the residents acquire the knowledge and skills required to excel in the clinical setting.

> I think we share a common vision, a common passion. We all believe in education, I think that through collaboration we can do greater things than we could independently. There's a sense of satisfaction of doing it.

Duration of Participation/Loyalty. Participants expressed feelings of loyalty to other volunteers in the network, especially those who have been involved for a longer duration.

> I think there's always going to be some loyalty because you've invested a great period of time. Also, it is one of the few tangible creations that you've helped develop and so you feel part of it.

Affect. Deep and meaningful emotional components connecting volunteers to the ACES program educator network were identified. Being part of a network elicited strong positive emotions. The enjoyment experienced by volunteers was strongly linked to interactions with other like-minded educators. The face-to-face interaction of volunteers

on an annual basis at varying Canadian locations was described as an essential part of the organization.

> When we meet it's like a bunch of friends getting together…everybody is full of energy when you arrive…everybody is happy, people are smiling…and you are basically like a big family…It's mostly, I think, emotional at that stage.

Quasi Volunteerism

Academic Pressure. The terms Quasi volunteer is reflected in both extrinsic and intrinsic motivations to extend effort into a relationship and/or activity. That is, volunteers in academic teaching hospitals described 'academic pressures', especially for younger doctors, where they felt they were required to meet specific academic expectations:

> The premise that its volunteerism is somewhat true. Nobody has a gun to my head saying I have to do it but we all have to do something, academically. So, I guess it's quasi-volunteerism. Like if I wasn't doing this I would have to, especially us younger docs, like we are all on some degree of academic pressure to keep the university happy. So, if I were not doing this teaching, I'd be doing something else, you know?

Curriculum Vitae. Intrinsically, participant volunteers used the teaching exposure at the national ACES course to grow their own CVs. As such, for some, the volunteer activities were not performed for purely altruistic reasons, but also for professional gain:

> It's good to have in your career, you have to have exposure to teaching outside of your center so this gives me the opportunity to fulfill that, so it's not all altruistic. it's something that I do need to do for my curriculum vitae.

Discussion

The productivity, success, and sustainability of the ACES organization depends on the recruitment, retention and recognition of volunteers in a collaborative network. As depicted in our conceptual framework, the synergistic effects of the individual's

emotional and cognitive engagement along with reciprocal engagement within the environmental context and culture of the organization, followed by a cue to action, leads to behavioural engagement in volunteer activities and contributions to the ACES program. Wherein the conceptual framework has underpinned and bounded the study, as described by Fredricks et al. (2004), we have also found that it is difficult to specifically separate out the behavioural, emotional and cognitive elements of engagement. We feel that our findings call for richer characterizations of how physicians behave, feel, and think.

Overall, our study yields several key findings that contribute to our understanding of what motivates physicians to volunteer, and perhaps more importantly what sustains their volunteerism. With respect to recruitment, we found that word-of-mouth recruitment was the primary behavioural vehicle to engage new members. In the marketing literature, word-of-mouth is defined as an interpersonal communication, independent of the organization's marketing activities, about an organization or its products.[33] Our findings support this literature in that word-of-mouth is a dyadic communication between a source and a recipient.[34] This implies that the occurrence of word-of-mouth is determined by characteristics of the recipient, the characteristics of the source, and their mutual relationship.[35,36]

Word-of-mouth communication was found to be particularly effective behavioral component in securing buy-in from new members when done early in the recruitment phase. That is, a phone call from one of the long-standing members of ACES early in the

selection phase was conducted so as to gain an initial impression of potential new members. This also tended to have the effect in attracting the potential recruit. This supports earlier research that demonstrated that receiving positive information through word-of-mouth early in the recruitment process is positively related to perceived organizational attractiveness and actual recruitment.[37] Within the business literature, this phenomenon is called the accessibility-diagnosticity model. The model suggests that information provided through word-of-mouth affects potential recruits' early evaluations of the organization because of its accessibility in memory and its feedback potential.[38,39] That is, if a physician receives positive word-of-mouth information on a given program or organization they are more likely to think favourably when asked at a later date to perform a volunteer activity. This finding has clear practical implications for practice in that organizations should try to stimulate positive word-of-mouth early in the recruitment process because of its positive impact on potential recruits attraction to an organization and subsequent retention.

Long-standing ACES volunteers take careful measures to select, and subsequently recruit new members. In turn, this recruitment effort has a significant impact on long-term retention. The majority of physicians recruited become committed to the ACES program and have long-term sustainability as volunteers. We have found that a key to this commitment and sustainability lies in the strength of the social networks among volunteer physicians. Research on teams in which dyads are found within larger groups of people (e.g., ACES volunteer physicians within the larger medical community) suggests that people are likely to collaborate with others who possess qualities and skills, and know-

how that are complementary to their own and relevant to reaching a particular objective.[40] Interestingly, we found that many of the new recruits were already well known to at least several of the ACES physician volunteers, and thus were already in their educator network. This supports the notion that people are inclined to create relationships with friends of their friends (or the business associates of their business associates). The effect of sharing mutual acquaintances on attachment appears to be additive in that each additional mutual acquaintance shared by an unconnected dyad (relationship) additionally increased the likelihood that they will become acquainted.[41] Perhaps the reason for the excellent retention and deep commitment of ACES physician volunteers is explained by the structure of the ACES social networks which comprises many third party connections. Research states that ties connecting people who share several common third party connections are more likely to withstand the test of time.[42,43] As related to our conceptual framework, we understand that physician volunteers exercise both emotional (intrinsic commitment & loyalty) and cognitive (intellectual challenge & constant change/growth) engagement that directly relate to the retention of volunteers.

Personal satisfaction was an overarching finding that mapped directly to the emotional and cognitive elements of engagement within the conceptual framework. Our study has shown that financial incentives are of low to absent value to physician volunteer engagement in all activities within the ACES program. The emotional and cognitive rewards coupled with reciprocal engagement were key elements. In addition, the organizational culture provided the basis for successful engagement. The need to enhance scholarly recognition was identified. Literature supports that the internal motivation is a

strong driver of volunteer teacher participation.[9] The high value placed on personal satisfaction appears to be consistent across a variety of contexts. This domain of personal satisfaction can be further broken down into the emotional, cognitive and reciprocal form of engagement and mapped to our conceptual framework. In particular, physicians felt a strong sense of cognitive engagement with regard to being 'pushed' out of their comfort zone so as to reach a new and expanded state of performance.

We found workload and increased external demands to be a threat to physician volunteer activities. Yet, in the ACES group we identified healthcare professionals that have remained engaged despite considerable external demands. In fact, most volunteers in this program would contribute further if called upon. The high level of engagement of these individuals is complex and involves many elements of the conceptual framework. In some circumstances, when other demands increased, volunteers modified their role and mentored new leaders, allowing for ongoing engagement. Moving away from traditional 'individual' leadership theories, team leadership theory includes the concept of team leadership capacity, which includes the entire range of the team's leadership.[44] It appears that the ACES organizational structure has capitalized on this distributed shared leadership approach to ensure sustainable and diversity of available leaders.

Limitations

There are several limitations to our study. It was a cross-sectional study, performed in a single context of highly engaged health care professionals most of whom were located at academic teaching hospitals. The nature of engagement within the organization may be

context specific. Further studies are required to determine the transferability our findings to other contexts. In our study we sought perspectives from volunteers performing various tasks. However, given the sample size it is not possible to determine if the underlying components of engagement change with variation in the roles. Further, we did not examine the time spent volunteering (e.g., hours/weeks per year) nor did we seek out individuals who may have volunteered but later completely withdrew. We will ensure to capture this data in our future work. Finally, when the volunteer role includes teaching, we identified that the reciprocal engagement between the student and teacher adds to the overall engagement of the volunteer. This component was not in our conceptual framework and could be added in future investigations where the volunteer role includes teaching.

Future Research

The presumption that engagement is malleable is an exciting prospect.[45,46] A cohesive framework is required to facilitate understanding of the complex construct of volunteer physician engagement and this framework can be utilized in the development of multifaceted approaches to enhance volunteer physician engagement. For example, an intervention may include enhancing reciprocal engagement through collaborative meetings and enhancing interpersonal relationships; emotional engagement by connecting with individuals on a deeper level with respect to the meaning and potential outcomes of their work; cognitive engagement by including intellectually challenging tasks, and recognition of the volunteers work through faculty appointment, newsletters among their peers, awards and scholarly acknowledgement. Further research is also required to

determine how we measure engagement. The conceptual framework presented in this paper may aid in the design of measurement tools. The strategies and tools may vary depending on type of volunteer activity and setting. Furthermore, research is required to explore the construct of disengagement, to determine if different professional "identities," such as nurses, respiratory therapists, administrators, have different facilitators and inhibitors to engagement. Future studies may also explore if volunteer participation impacts an individuals' clinical practice or career path.

Conclusion

Volunteer physicians are essential to the growth and sustainability of the ACES program. This organization has demonstrated great success with engaging highly effective volunteers. Our conceptual framework and qualitative findings provide a preliminary framework as an important initial step in understanding the complex construct of volunteer physician engagement. This study will guide us in our development of a multifaceted intervention, aligned with the conceptual framework, to enhance volunteer physician engagement within the organization. Finally, given the current economic climate, providing compensation may not be financially feasible or sustainable so alternative approaches must be explored to engage volunteer physicians.

Contributors: Dr. Sarti and Dr. Sutherland had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
Study concept and design: Sarti, Sutherland, Landriault, DesRosier, Brien, Cardinal
Acquisition of data: Sarti, Sutherland, Landriault, DesRosier
Analysis and interpretation of data: Sarti, Sutherland, Landriault, Cardinal
Drafting of the manuscript: Sarti and Sutherland
Critical revision of the manuscript for important intellectual content: Sarti, Sutherland, Landriault, DesRosier, Brien, Cardinal
Obtained funding: Landriault, Brien, Cardinal
Administrative, technical, or material support: Landriault, DesRosier
Study supervision: Sarti, Sutherland, Cardinal
All authors have approved the final version of this manuscript.

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List of Figures:

List of Tables:

List of Supplemental Online Content

Appendix S1. Interview Guides.

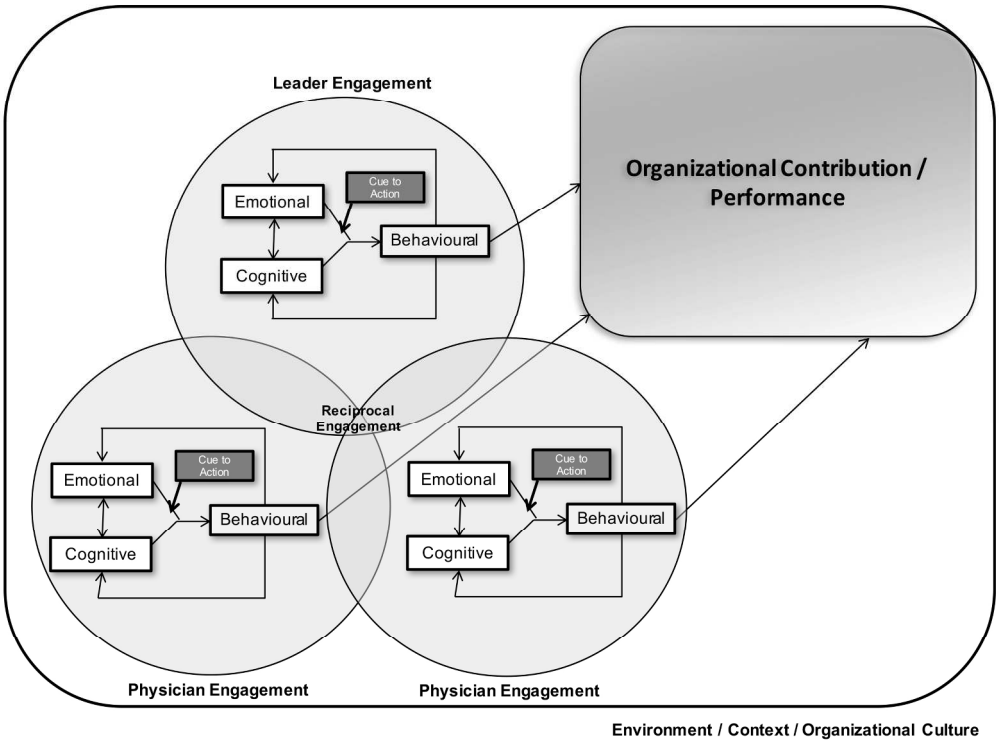

Figure 1. Conceptual Framework

215x161mm (300 x 300 DPI)

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a. Common vision b. Duration or participation/loyalty c. Affect
6. Quasi Volunteerism
a. Academic pressure b. Curriculum vitae

Interview Guide 1

Introduction

1. Introduction
   Thanks for agreeing to participate … We are conducting a needs assessment for the ACES course (introduce the project). Consent.

2. Background
   a. Goal of the ACES course - provide the learner with the necessary knowledge, skills and attitude to recognize and manage a patient who is acutely and critically ill in the first hour of presentation
   b. Modality of the ACES course - multimodal: e-learning, book, case seminars, technical skill workshop, simulation, and bedside tools
3. Purpose of the needs assessment
   a. Interest expressed by various groups to customize the ACES course to a specific population
   b. Facilitate the dissemination of the course across Canada
   c. Exploring interest in an interprofessional course
   d. Explore business models that would facilitate dissemination
   e. Explore peer-review process and means of promoting academic contributions of faculty
4. Please let us know if you are NOT in a position to answer some of the questions (e.g. vice-dean discussing weaknesses of residents during resuscitation)
5. Interview will be recorded; all information will be kept confidential

Demographics

1. What is your professional designation?
2. What are your current roles?
3. Can you let me know what type of institution you work in (Community Hospital, Secondary, Tertiary, and Quaternary)?
4. When it comes to responding to a crisis, what is the usual makeup of the team in your institution?
5. Are you familiar with the ACES course? Have you participated or taught an ACES course?

Content

1. When it comes to responding to a crisis, what are the team's strengths?
2. When it comes to responding to a crisis, what are team's weaknesses?
3. Probes
   a. What about (mention any members of the team that have not been addressed)

4. At the end of the course, the learner should be able to…….. (Please list the 5 most important performance objectives)
5. Is there anything else that you can think of that we have not discussed?

Course format

1. Do you think that pre-course on-line content would be useful?
    a. Do you anticipate that you or your learners may have any problems accessing online material?
    b. What is the purpose of having pre-course on-line content?
        i. Teaching knowledge, decision-making, other?
        ii. Preparation for the face-to-face course
        iii. Assessment of learners?
        iv. Others
    c. What should be the duration of a pre-course on-line session?
    d. Should the pre-course on-line content be mandatory?
        i. If so, can you think of ways to ensure your or your learners compliance with mandatory online content?

2. Do you think that post-course on-line content would be useful?
    a. Would it be useful for you to have access to the pre-course on-line content after the course for further revision? How long?
    b. What is the purpose of having post-course on-line content?
        i. Teaching knowledge, decision-making, other?
        ii. Preparation for the face-to-face course
        iii. Assessment of learners?
        iv. Post-course assessment of knowledge retention
        v. Others
    c. What should be the duration of an on-line session?
        i. Post face-to-face course
    d. Should post-course on-line content be mandatory?
        i. If so, can you think of ways to ensure your or your learners compliance with mandatory online content?

3. Do you think that the program should have a face-to-face course?
    a. How long should the course be?
    b. What should be the preferred modalities?
        a. Simulation?
        b. Case-based seminars?
        c. Technical skills workshops?
        d. Didactic lecture?

e. Other?

c. What should be the relative proportion of time spent for each modality?
   a. Simulation?
   b. Case-based seminars?
   c. Technical skills workshops?
   d. Didactic lecture?
   e. Other?

d. Should the pre-course material be reviewed during the face-to-face course?

e. What should determine the instructor to participant ratio?
   a. Simulation?
   b. Case-based seminars?
   c. Technical skills workshops?
   d. Didactic lecture?
   e. Other?

f. Tell me what you think about making this course interprofessional…
   a. What would be the advantages?
   b. What would be the challenges?

4. How complicated is it for your institution/organization to organize a course that contains a large components of simulation training?
   a. Do you have access to simulation laboratory with the required equipment?
   b. Do you have access to simulation engineer
   c. Do you have trained instructors
   d. Do you have course co-coordinators with experience delivering such courses

Market analysis

1. What do you like most about the ACES course?
2. What changes would most improve the ACES course?
3. Do you know of competing courses currently available?
4. What do you like the most about these other courses?
5. What changes would most improve these other courses?
6. If you are not likely to deliver the ACES course, why not?
7. What would make you more likely to deliver the ACES course?
   a. Is costing an issue?
   b. Are difficulties delivering the ACES course an issue?
      i. Low participants to instructor ratio
      ii. Space
      iii. Equipment

iv. Personnel (simulation engineer, trained actors, course coordinator)

8. Imagine that you are tasked to widely disseminate this course in order to improve patient care. Can you think of a business model that would favor wide dissemination?
    a. Keeping in mind that there is a cost related to the development and dissemination of the material.

Peer review process

1. Do you have any suggestions on how to best organize and facilitate the peer-review process?
    a. Initially
    b. On an ongoing process

Recognition

1. How could the Royal College best recognize your or your institution's contributions in the creation and delivery of the ACES course?
    a. Would it help if creators were informed of their material evaluations and extent of dissemination? How often?
    b. Would including the sums invested in the completion of the project be useful as a means of recognition?

Interview Guide 2

Volunteer Engagement in the ACES program

- Target – Leadership within the organization and some Volunteer Physicians
- Introduction, Confidentiality, Consent

Leadership Questions:

1. What is your role in the ACES program?
2. How do volunteers impact the program? Has this changed over the years / history of the program?
3. Who are the volunteers?
4. Where are they located?
5. What roles do volunteers perform?
    a. *Probe – development, delivery, administration, promotion of the program, etc. Specifically link to the conceptual framework*
6. Are there more ways that you envision them being involved?
7. Why do you think physicians volunteer their time with the ACES program?
    a. *Probes: To be completed -*
        i. *Behavioural*
        ii. *Emotional*
        iii. *Cognitive*
            1. *The challenge of the activity? Or mastering challenging / difficult ideas/skills/tasks?*
8. How are they currently recruited?
9. What are the barriers to recruitment and retention of volunteers?
10. What are the facilitators to recruitment and retention of volunteers?
11. How are they rewarded/appreciated for their contribution?
12. How do you see the ACES program evolving and how will this impact the volunteers? Impact the need for volunteers?
13. If a need for more volunteers is identified - Any solutions to increasing capacity and retention?

Questions regarding your volunteer involvement

14. Do you volunteer time with the ACES program?
15. What activities / role do you perform as a volunteer?
16. Why do you volunteer?
17. How is your contribution acknowledged?

Volunteer Questions:

1. What is your role in the ACES program?
2. How long have you been a volunteer with ACES?
3. How did you become involved with ACES?
4. Why do you volunteer?
    a. *Probes:*
        i. *Behavioural*
        ii. *Emotional*
        iii. *Cognitive*
            1. *Do find this work challenging? by the activity and or your involvement? Or mastering challenging / difficult ideas/skills/tasks?*
    b. What specifically – ie, what part is challenging? What part do you 'love'? what part are you most 'interested' in?
5. Have you ever considered increasing your involvement with ACES?
6. Have you ever considered decreasing or discontinuing your involvement with ACES?
7. Are there factors that maintain your involvement with ACES?
8. What improvements could be made to better meet your needs as a volunteer with the organization?

COREQ Checklist for Qualitative Study.

Domain 1: Research team and reflexivity

Personal Characteristics

1. Interviewer/facilitator - Which author/s conducted the interview or focus group?

- A.S., S.S., A.L.

2. Credentials - What were the researcher's credentials?

- A.S.: MD, MEd
- S.S.: PhD
- A.L.: RN, BScN.

3. Occupation - What was their occupation at the time of the study?

- A.S. – Intensivist / Clinical Scholar, The Ottawa Hospital; Clinician Investigator in the Clinical Epidemiology Program (CEP) at the Ottawa Hospital Research Institute (OHRI)
- S.S. Research consultant for The Department of Critical Care, The Ottawa Hospital
- A.L. – Instructional/Curriculum Designer at the Royal College of Physicians and Surgeons of Canada; practicing Critical Care nurse in a tertiary Intensive Care Unit

4. Gender - Was the researcher male or female?

- All interviewers were female

5. Experience and training - What experience or training did the researcher have?

- A.S. was in her second year of a clinical scholars program. She completed a fellowship with the Academy for Innovation in Medical Education at the University of Ottawa, and was a Masters of Health Professionals Education Candidate, University of Dundee, Scotland. She had performed numerous qualitative and mixed method investigations.
- S.S. has expertise in mixed methods research with an MA (Hons.) in measurement and evaluation, and a PhD in educational research, with 20 years of research and evaluation experience.
- A.L. has gained experience in conducting needs assessment (using interviews, focus groups and walkthrough) for the development of educational material as part of her occupation and was in the process of completing her Masters of Education (MA Ed) which included graduate level courses in qualitative methods. She had also received training in interviewing skills.
- Co-authors experienced in both quantitative and qualitative research, medical education, palliative and critical care.

Relationship with participants

6. Relationship established - Was a relationship established prior to study commencement?

- No.

7. Participant knowledge of the interviewer - What did the participants know about the researcher?

- Participants were aware of the rationale for the study and the researcher's level of training.

8. Interviewer characteristics - What characteristics were reported about the interviewer/facilitator?

- The interviewer's level of training and occupation were reported.

Domain 2: Study design

Theoretical framework

9. Methodological orientation and Theory - What methodological orientation was stated to underpin the study?

- Qualitative investigation with constructivism as guiding theoretical framework.

Participant selection

10. Sampling - How were participants selected?

- Purposive, snowball sampling.

11. Method of approach - How were participants approached?

- Email and telephone.

12. Sample size - How many participants were in the study?

- 30 interviews

13. Non-participation- How many people refused to participate or dropped out? Reasons?

- 0

Setting

14. Setting of data collection - Where was the data collected?

- Telephone interviews

15. Presence of non-participants Was anyone else present besides the participants and researchers?

- No

16. Description of sample - What are the important characteristics of the sample?

- Secondary qualitative analysis was undertaken on fifteen semi-structured interviews with participants, including program directors and health care professionals across Canada. An additional fifteen interviews with physician volunteers were conducted to achieve thematic saturation.

Data collection

17. Interview guide - Were questions, prompts, guides provided by the authors? Was it pilot tested?

- Semi structured guides were developed for the focus groups, interviews, and walkthroughs, with probes to guide as necessary. All tools were pilot tested prior to use in this study.

18. Repeat interviews - Were repeat interviews carried out?

- No.

19. Audio/visual recording - Did the research use audio or visual recording to collect the data?

- Interviews were audio recorded and transcribed.

20. Field notes - Were field notes made during and/or after the interview or focus group?

- Yes, both during and after.

21. Duration - What was the duration of the interviews or focus group?

- Interviews were approximately 1 hour.

22. Data saturation - Was data saturation discussed?

- Yes

23. Transcripts returned - Were transcripts returned to participants for comment and/or correction?

- No, the transcripts were not returned to the participants. To ensure accuracy of transcriptions, each transcript was verified with the audio recordings prior to data analysis.

Domain 3: Analysis and findings

Data analysis

24. Number of data coders - How many data coders coded the data?

- Three researchers coded the data

25. Description of the coding tree - Did authors provide a description of the coding tree?

- No. Available upon request.

26. Derivation of themes - Were themes identified in advance or derived from the data?

- Inductive – Themes were derived from the data

27. Software - What software, if applicable, was used to manage the data?

- Yes, NVIVO

28. Participant checking - Did participants provide feedback on the findings?

- No

Reporting

29. Quotations presented - Were participant quotations presented to illustrate the themes / findings? Was each quotation identified?

- Yes

30. Data and findings consistent - Was there consistency between the data presented and the findings?

- Yes

31. Clarity of major themes - Were major themes clearly presented in the findings?

- Yes

32. Clarity of minor themes - Is there a description of diverse cases or discussion of minor themes?

- Yes

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Exploring the components of physician volunteer engagement: a qualitative investigation of a national Canadian simulation based training program

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Exploring the components of physician volunteer engagement: a qualitative investigation of a national Canadian simulation based training program

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Key Words: volunteer, engagement, qualitative research, medical education, critical care

Abstract

Objectives: Conceptual clarity on physician volunteer engagement is lacking in the medical literature. The aim of this study was to present a conceptual framework to describe the elements which influence physician volunteer engagement and to explore volunteer engagement within a national educational program.

Setting: The context for this study was the Acute Critical Events Simulation (ACES) program in Canada, which has successfully evolved into a national educational program, driven by physician volunteers. From 2010 to 2014 the program recruited 73 volunteer health care professionals who contributed to the creation of educational materials and/or served as instructors.

Method: A conceptual framework was constructed based on an extensive literature review and expert consultation. Secondary qualitative analysis was undertaken on fifteen semi-structured interviews conducted from 2012 to 2013 with program directors and health care professionals across Canada. An additional fifteen interviews were conducted in 2015 with physician volunteers to achieve thematic saturation. Data was analyzed iteratively and inductive coding techniques applied.

Results: From the physician volunteer data, eleven themes emerged. The most prominent themes included volunteer recruitment, retention, exchange, recognition, educator network, and quasi volunteerism. Captured within these interrelated themes were the framework elements, including the synergistic effects of emotional, cognitive and reciprocal engagement. Behavioural engagement was driven by these factors along with a cue to action, which led to contributions to the ACES program.

Conclusion: This investigation provides a preliminary framework and supportive evidence towards understanding the complex construct of physician volunteer engagement. The need for this research is particularly important in present day, where growing fiscal constraints create challenges for medical education to do more with less.

Article Summary

Strengths and limitations of this study

- First study to synthesize key elements of physician volunteer engagement into a conceptual framework.
- Covers an under-investigated issue and draws upon a wider theoretical background.
- Qualitative data obtained provides new insights into physician volunteer engagement, which may offer practical ideas to improve volunteer engagement strategies.
- Our findings were obtained in one country, within one national program.
- Explored volunteer engagement in a highly engaged group of physicians, study was not able to explore disengagement.

Introduction

Physician volunteers are essential to health care delivery and medical education.[1] Despite the growing need to optimize volunteer physician engagement, there is a paucity of data on how to improve and maintain engagement. Volunteerism can be defined as any altruistic act, which is undertaken without financial gain while engagement has been defined as being "actively committed" or "to involve oneself or become occupied; to participate."[2,3]

Physicians appear to highly value their role as volunteers. In a US study by Gruen et al., 95 % of physicians surveyed rated community participation as important".[4] Yet, in a national survey of 319 physicians, only 39% participated in volunteer activities.[5] Therefore, there appears to be a wide gap between the perceived importance of volunteering and its translation into action or engagement. Such studies illustrate the need to better understand the determinants of physician volunteer engagement and the ways in which it can be optimized.

Most of the medical literature on engagement is centered on the patient and behaviors that promote health. A few isolated studies focusing on physician engagement were identified but there is currently no accepted model describing the multifaceted dimensions of physician volunteer engagement.[6-10] We can draw from the social science literature in order to define and examine the various components of engagement.

The concept of engagement, specifically, school engagement has been synthesized in a review by Fredricks et al.[11] They present engagement as a multifaceted construct including three dynamically interrelated components: behavioural, emotional and cognitive engagement. Behavioural engagement is related specifically to the on task behavior. Emotional engagement is related to the value of the tasks as determined by the individual. Value is further divided into 4 components: "interest (enjoyment of the task), attainment value (importance of doing well on the task for confirming aspects of one's self-schema), utility value (importance of the task for future goals), and cost (negative aspects of engaging in the task)."[11] Cognitive engagement refers to an individual's motivational goals and self-regulated learning. This concept can be further described as a psychological investment in learning, understanding, and mastering knowledge or skills with a "desire to go beyond the requirements, and a preference for challenge."[11]

In this study, we sought to develop a conceptual framework to describe and explore the components and theoretical underpinnings of physician volunteer engagement. We began our investigation with a secondary analysis of a comprehensive needs assessment in a quality improvement initiative aimed at the overall enhancement of the Acute Critical Events Simulation (ACES) program. Later, we extended this initial work by obtaining additional data to provide evidence towards understanding the complex construct of physician volunteer engagement.

Context

The ACES Program is a national educational program aimed at improving the proficiency of individuals and teams involved in the early management of critically ill patients. Nurses, respiratory therapists, and physicians who are the first to respond to a patient in crisis come from various disciplines and practice in diverse milieus. Their experience managing acutely ill patients is often very limited given the low incidence of critical illness. Yet, clinical studies indicate that early recognition and management are most effective in lowering both morbidity and mortality. Randomized controlled trials and guidelines emphasize the importance of the 'golden-hour' in patients with conditions such as myocardial infarction, stroke, and sepsis.[12-17] The ACES program includes various simulation modalities delivered online or face-to-face as well as books and didactic material. It also includes instructor certification courses. Most of the educational materials have been customized to meet the needs of different groups of learners.

This program was initially developed from the vision and efforts of a small collective of Canadian critical care physicians who volunteered their time and expertise. It has successfully evolved into a national educational program, has been acquired by the Royal College of Physicians and Surgeons of Canada (RCPSC), and continues to advance and grow. Volunteers remain fundamental to the ACES program. They create materials, organize courses, teach, and conduct research. From 2010 to 2014 the program recruited a total of 73 volunteers, 69 of whom were physicians. The need for volunteers is increasing due to greater demand, addition of new forms of simulation, growth of online curricula and anticipated movement to a competency-based program.

Method

A conceptual framework was constructed; secondary analysis of the ACES quality improvement initiative data was performed; additional interviews were conducted; qualitative data collection was performed and analyzed iteratively.

Conceptual Framework

A conceptual framework is meant to explain the key factors, constructs, or variables, and their presumed relationships to be studied.[18,19] An extensive literature review along with expert consultation informed the development of the framework. We opted for a more pre-structured qualitative research design as we wanted to bound the study within a set of engagement variables, yet at the same time we needed to maintain enough flexibility to allow for emergent findings so as to better understand the construct of physician engagement. We adapted a student engagement conceptual framework.[11] We found Fredericks et al.'s theory of engagement to be useful in our medical context. In further modifying the conceptual framework we used the 'bins approach,' whereby the framework is mostly a visual catalogue of roles to be studied (e.g., physician leaders and physicians), and within each role, how the variables of engagement influence their actions.[19] A multidisciplinary panel of experts iteratively collaborated on the modifications to the conceptual framework included critical care physicians and leaders, administrators, system-level policymakers and a sociologist.

We developed the model depicted in Figure 1, to explore volunteer physician engagement in a comprehensive manner. For our study, the physician behavior of participation as a

volunteer is the desired outcome. All other elements, which contribute and lead to this behavior are under investigation. In this figure, we have depicted two physicians and one leader for simplicity. In reality there may be many leaders and physicians. We define a leader as an individual within the group who influences others towards a mutual purpose or common goal.[20] We define an individual's engagement as a multidimensional construct including emotional and cognitive engagement which ultimately can lead to behavioral engagement, with tasks directed toward contributing to organizational development and/or a specific domain, such as education, quality and safety, etc.[11]

<insert Figure 1 about here>

An individual's overall engagement is impacted by their demographic and psychosocial characteristics. The emotional and cognitive components drive behavior. The bidirectional arrows between these components indicates that the presence and/or development of one component may impact the other. The behavior itself may further promote the emotional and cognitive components and enhance volunteer behaviors (indicated by the arrow back to the emotional and cognitive components). In addition, the behavior requires a "cue to action" or trigger (which can be either intrinsic or extrinsic to the individual). A simplistic example of an extrinsic "cue to action" may involve the director of the program contacting a volunteer to participate.

Individual volunteers have the potential to impact each other and synergistically enhance one another's engagement.' We have termed this variable "reciprocal engagement." This

is akin to mutual engagement involving not only individual actions/attributes but also the actions/attributes of others.[21] This relationship and enhanced engagement potential is likely secondary to the impact on the individuals' emotional, cognitive and behavioral components and/or may provide a trigger leading to the behavior.

Leaders have their own intrinsic characteristics, emotional and cognitive components which drive the behavior. Reciprocal engagement may also synergistically increase the engagement of both the leader and individuals.

Ultimately, the behavioral engagement of the individual volunteers can lead to increased organizational performance.[22] Sustainability of the volunteers likely depends on these factors being maintained and may fluctuate for an individual over time with periods of greater and lesser engagement, for example based on the presence or absence of a "cue to action" and also based on changes in organizational culture, leadership and other individuals.

Data Collection and Analysis

As part of a quality improvement initiative of the ACES program, interviews were conducted by AL between 2012 to 2013. Participant selection was carried out using maximum variation purposive sampling to identify individuals that would provide a balanced representation.[23-25] All participants were initially contacted by email or telephone. Participants included program directors from different specialties and health care professionals from different backgrounds. Upon analysis of this interview data the

'physician as volunteer' theme was identified. To further explore this finding, and achieve thematic saturation AS and SS performed additional telephone interviews with physician volunteers in 2015.

Semi-structured interview guides were designed to follow a broad, pre-determined line of inquiry that was flexible and that could evolve as data collection unfolded, permitting exploration of emerging themes. Interview guides were created by an interdisciplinary team of investigators with expertise in medical education, simulation, sociological and qualitative research methods. Interview guides were piloted with a sub group of ACES instructors who were not involved in the research study. None of the interviewers had a relationship with any of the study participants prior to study commencement. Study participants were made aware of the interviewers' level of training and organizational affiliation(s). Interviews lasted from forty-five to sixty minutes, were audio-recorded, and transcribed verbatim. (See Appendix S1, online for interview guides). The interviewers (AS and SS) took ongoing field notes during the data collection process to aid in the analysis phase.

Qualitative data analysis of the comprehensive data set included the application of inductive coding techniques, utilizing thematic content analysis, and NVIVO software for data management.[19,23] The research team followed Creswell's coding process where data is first explored to gain a general sense of the data and then coded. These codes were described and collapsed into themes.[23] The analysis team consisted of 3 researchers (AS, SS and AL) who participated in coding training and meetings to develop the coding tree

and codebook. The three researchers (AS, SS and AL) generated codes (from the same interview transcripts) independently. Then, they engaged in consensus discussions. Inter-rater reliability, assessed prior to independent coding, demonstrated a 95.73% agreement and a 0.75 Kappa score which is considered to be substantial agreement.[26] The volunteer construct was further explored and coded, through a more focused analytic approach in order to gain an in-depth understanding of volunteer engagement.[27] In an iterative process, additional interviews were performed to reach saturation of the subthemes specific to volunteer engagement. To ensure the analysis process, and subsequent themes were appropriate and reflected ACES facilitators/leaders views, members of our research team who worked with the ACES program (PC and AL) engaged in informal discussions with ACES members so as to vet the findings. This study was granted an official exemption by The Ottawa Hospital Research Ethics Board.

Results

For the larger study (quality improvement initiative of the ACES program) 15 interviews were performed to gain a broad and comprehensive understanding of the ACES program, which included program directors and health care professionals across Canada; physicians (n=11), nurses (n=2) and RTs (n=2) (interview guide 1). An additional 15 interviews of physician volunteers were performed (interview guide 2). Overall, thirty of thirty-three invited individuals agreed to participate in the semi-structured interviews for a response rate of 91%. All physician volunteers that were interviewed were full time clinicians and members of the ACES faculty, who are called to participate as needed. Participants are displayed in Table 1.

Table 1. Characteristics of interview participants.

Characteristic	n	%
Number	30	
Region *		
Mountain	7	23
Prairies	3	10
Ontario	14	47
Quebec	2	7
Atlantic	4	13
Specialty/Discipline **		
Critical Care	23	77
Anesthesia	7	23
Internal Medicine	5	17
Surgery	3	10
Family Medicine	3	10
Nurses	2	7
Respiratory Therapists	2	7
Pediatric Critical Care	1	3

** The regions of Canada have been divided in the following way: Mountain includes British Columbia and Alberta; Prairies include Saskatchewan and Manitoba; Atlantic includes all Atlantic Provinces.*
*** Individuals were classified under their current practice specialties. Note that an individual may be practicing in more than one specialty.*

To gain an in-depth understanding of the phenomenon of volunteer engagement, the data set was coded and 11 themes were identified and sub-coded. Of these themes, six interrelated themes – volunteer recruitment, volunteer retention, volunteer exchange, volunteer recognition, educator network, and quasi-volunteerism were most prominent in our data. A summary of the qualitative findings is presented in Table 2. Representative quotes are provided to illustrate each theme.

Table 2: Summary of the qualitative findings.

1. Volunteer Recruitment
a. Word of mouth
b. Snowball approach

c. Career stage
2. Volunteer Retention
a. Distributed leadership and career paths
b. Program change and evolution/innovation
c. Comfort zone
d. Reciprocal engagement
e. Intrinsic motivation
f. Learners
g. Barriers
3. Volunteer Exchange
a. Career opportunities
b. Keep current
c. Academic currency
4. Volunteer Recognition
a. Personal recognition
b. Scholarly/academic work
5. Educator Network
a. Common vision
b. Duration or participation/loyalty
c. Affect
6. Quasi Volunteerism
a. Academic pressure
b. Curriculum vitae

Volunteer Recruitment

Word of Mouth. All recruitment was accomplished through word of mouth. That is, the cue to action was uniformly described by volunteers as an informal interaction with another volunteer, usually a leader who would call the volunteers to request their involvement.

> I just got a call from him [ACES Director] one day, he introduced himself and talked about this program where a few guys were getting together and trying to do this thing and at that time there were, I don't know, about 6 or 7 guys and he asked if I wanted to be part of it.

Snowball Approach. A snowball approach was described by participants as a means of identifying and recruiting high quality volunteers. With this approach, leaders would

contact volunteers within the group, who in turn would reach out to contacts in their social networks to identify potential new recruits who have the qualities required to contribute to the group.

> What I would do is have more than one person get in touch with the person they are trying to recruit. First of all you want to cherry pick the people you want to recruit. It's just like a draft in sports or something. You want to cherry pick the people you want on your team and once you've earmarked certain people and say, "this person is not just strong clinically but also has great personal skills, is humble enough to listen to feedback, and to not get offended by it but to work with it."

Career Stage. Participants explored the different career stages of physicians who are recruited to volunteer with the program and felt that younger physicians are generally easier to recruit.

> If it was in the middle part of their [physician] career, they may be on a certain track and it's difficult to engage them. I think it would be great if we could recruit people at mid-career because they have a bit more experience, a bit more knowledge about how things should work or how things should flow. On the other hand, if you recruit younger people, I think they are more enthusiastic and have completely new ideas and that's not a bad thing either right? For me, it was great to be involved early on but I was definitely a little shy to come forward with suggestions initially because, yeah, it's just a very established crowd.

Volunteer Retention

Distributed Leadership and Career Paths. The organization embraces an open culture creating a collaborative environment, which allows for new leaders to be brought in and mentored by long standing leaders. This relationship enables long-standing leaders to remain involved with the program while balancing other career demands. In this way, ACES is able to deepen its leadership base by distributing responsibilities to others.

> I have decreased in participation, though I still remain section chair, well it is more of a co-chair position because I have a capable colleague who has taken over some of the curriculum development…I don't see myself in this role for perpetuity and so it's a good opportunity for people to transition and I think it's

> part of the natural transition process. I still remain involved and committed to being part of the National ACES Program and I still assist locally but I have decreased my involvement. It is more of a career choice and balancing the different aspects of my career that I've taken on as well.

Program Change and Evolution. The program's continual growth, ongoing modifications and innovative nature were described by volunteers as being very intellectually stimulating. This cognitive component was described by many participants as a major contributor to their initial and ongoing commitment and involvement with the program.

> I think the fact that we change and we grow is very important. If it was just the same program every year it will eventually become stagnant and people will lose interest.

Comfort Zone. Comfort zone is indicative of a behavioral state within which a person operates in an 'anxiety neutral' condition. The objective is to push or lead individuals beyond their comfort zone until comfort is achieved, which enables a consistent high-level performance. During their interviews volunteers were asked if they felt they were drawn to more challenging tasks. One physician put it like this,

> So, why is it that you have to get out of your comfort zone? Why do you have to embark on a new mission or path that is quite challenging, one that there is no guarantee that it is going to work? I actually enjoy the process. I love working with others, I love creating things, and I love taking something that's just in the idea stage, and you know transforming it into something that's actually real.

Reciprocal Engagement. Participants identified that a volunteer can enhance another volunteer's engagement and this process is cyclical. Participants further identified that interacting and connecting with students further enhanced their overall engagement.

> It's amazing to go [to the ACES course] and see all these people giving their time because they love to teach and want people to do better. They are genuinely interested in the well-being of these fellows to be better doctors and it's catching you can't help but get your love of education back.

Intrinsic Motivation. We use the psychological lens of motivation to underpin our understanding of intrinsic motivation. There is a fundamental distinction between actions that are self-determined and those that are controlled. The former, which reflects an individual's personal attributes and internal (intrinsic) motivation, was identified as contributing to the volunteers' participation in the program. The answer might be as simple as, 'I was built like that. This is who I am'. In fact, many described a strong internal drive to participate, hoping that they 'would be called' to action more frequently to perform tasks for the organization. Interestingly, participants spoke of a willingness to give more of their time, noting that financial incentives were of low to absent value in their activities with the ACES program One participant described his experience like sitting on the bench waiting for the coach to call:

> I guess one of the biggest things as a volunteer, you're always somebody who is kind of on the bench and the coach may call you into play at any time. And, you kind of wonder if you're gonna get called off the bench to play…I love it and I love being invited back each time.

Learners. Fellows, often referred to as high-level learners by the volunteers, served as catalysts for both emotional and cognitive engagement in the ACES program. Some volunteers expressed the gratification they felt in teaching the next generation of intensivists, while others expressed the fulfillment in teaching such advanced learners:

> It's gratifying to feel like you are teaching the next generation of docs as they come through and they are high level learners who are about to become intensivists themselves so they are keen to learn.

Barriers. The main barriers to retention included career trajectory (as described above) and individual time constraints, including both personal and professional demands. As volunteer physicians continue along their career they may choose different pursuits (e.g., research) and then do not have time to remain an ACES volunteer.

Volunteer Exchange

Career Opportunities. We use volunteer exchange from the theory of social exchange which posits that social behavior is the result of an exchange process.[28] Volunteers noted that aside from receiving continuing medical education (CME) credit for their volunteerism, their participation in the ACES course provided additional benefits for their careers:

> Being an ACES volunteer means that this is Royal College (RC) accredited and I think that speaks a lot to the quality of the course but also for an academic person who might have additional interests in teaching more RC courses, this work stands out quite a bit.

Keeping Current. Volunteering in the ACES course gave individuals the benefit of staying current at a national level. This knowledge acquisition and networking opportunity both enhanced an individual's practice personally and professionally.

> It's a good group of people, so it's always a good time and it's a way to keep your finger on the pulse of how things are going nationally and talk to people about what is going on in other centers.

Academic Currency. The benefit of volunteering in the course was viewed by many individuals in terms of professional value whereby the experience counts towards promotion and tenure at an academic institution.

> It's always something you can list in your own CV within our medical practice plan. Teaching at these things counts in terms of academic points, you can put down each year that you taught this and that has academic currency.

Contributing to another's program was further described as a method of building up ones currency in that there was an expectation that, in turn, volunteer peers would "pay back" the favor at a later date.

Volunteer Recognition

Personal Recognition. Attainment value, such that involvement of volunteers with the program confirmed aspects of one's self "this is who I am," was further described in the form of personal recognition of their role as educators, by colleagues at other universities, across the country.

Scholarly/Academic Work. Volunteers want their work in the ACES program to be recognized as scholarly contributions. The ACES program leadership sends letters of recognition to volunteers' department heads, however, participants described difficulty in getting universities to recognize ACES contributions as scholarly.

> I think ACES does a very good job at recognizing our contributions. They catalogue and document the contributions on an annual basis, they send letters to our Department heads so they recognize us. I think the greater impact is to have an opportunity to enhance this recognition as scholarly work, to meet the criteria for standard publication in a peer review outlet.

Educator Network

Common Vision. Personal perceptions of the importance of the volunteer work coupled with a common vision, passion for education and collaborative spirit was described by participants. At the highest level the penultimate goal of potentially impacting patient care as an outcome was described by both leaders and volunteers. The potential effect on patient care (utility value) was further described as being achievable through the

volunteers' abilities and opportunity to help the residents acquire the knowledge and skills required to excel in the clinical setting.

> I think we share a common vision, a common passion. We all believe in education, I think that through collaboration we can do greater things than we could independently. There's a sense of satisfaction of doing it.

Duration of Participation/Loyalty. Participants expressed feelings of loyalty to other volunteers in the network, especially those who have been involved for a longer duration.

> I think there's always going to be some loyalty because you've invested a great period of time. Also, it is one of the few tangible creations that you've helped develop and so you feel part of it.

Affect. Deep and meaningful emotional components connecting volunteers to the ACES program educator network were identified. Being part of a network elicited strong positive emotions. The enjoyment experienced by volunteers was strongly linked to interactions with other like-minded educators. The face-to-face interaction of volunteers on an annual basis at varying Canadian locations was described as an essential part of the organization.

> When we meet it's like a bunch of friends getting together…everybody is full of energy when you arrive…everybody is happy, people are smiling…and you are basically like a big family…It's mostly, I think, emotional at that stage.

Quasi Volunteerism

Academic Pressure. The terms Quasi volunteer is reflected in both extrinsic and intrinsic motivations to extend effort into a relationship and/or activity. That is, volunteers in academic teaching hospitals described 'academic pressures', especially for younger doctors, where they felt they were required to meet specific academic expectations:

> The premise that its volunteerism is somewhat true. Nobody has a gun to my

> head saying I have to do it but we all have to do something, academically. So, I guess it's quasi-volunteerism. Like if I wasn't doing this I would have to, especially us younger docs, like we are all on some degree of academic pressure to keep the university happy. So, if I were not doing this teaching, I'd be doing something else, you know?

Curriculum Vitae. Intrinsically, participant volunteers used the teaching exposure at the national ACES course to grow their own CVs. As such, for some, the volunteer activities were not performed for purely altruistic reasons, but also for professional gain:

> It's good to have in your career, you have to have exposure to teaching outside of your center so this gives me the opportunity to fulfill that, so it's not all altruistic. it's something that I do need to do for my curriculum vitae.

Discussion

The productivity, success, and sustainability of the ACES organization depends on the recruitment, retention and recognition of volunteers in a collaborative network. As depicted in our conceptual framework, the synergistic effects of the individual's emotional and cognitive engagement along with reciprocal engagement within the environmental context and culture of the organization, followed by a cue to action, leads to behavioural engagement in volunteer activities and contributions to the ACES program. Wherein the conceptual framework has underpinned and bounded the study, as described by Fredricks et al. (2004), we have also found that it is difficult to specifically separate out the behavioural, emotional and cognitive elements of engagement. We feel that our findings call for richer characterizations of how physicians behave, feel, and think.

Overall, our study yields several key findings that contribute to our understanding of what motivates physicians to volunteer, and perhaps more importantly what sustains their volunteerism. With respect to recruitment, we found that word-of-mouth recruitment was the primary behavioural vehicle to engage new members. In the marketing literature, word-of-mouth is defined as an interpersonal communication, independent of the organization's marketing activities, about an organization or its products.[29] Our findings support this literature in that word-of-mouth is a dyadic communication between a source and a recipient.[30] This implies that the occurrence of word-of-mouth is determined by characteristics of the recipient, the characteristics of the source, and their mutual relationship.[31,32]

Word-of-mouth communication was found to be particularly effective behavioral component in securing buy-in from new members when done early in the recruitment phase. That is, a phone call from one of the long-standing members of ACES early in the selection phase was conducted so as to gain an initial impression of potential new members. This also tended to have the effect in attracting the potential recruit. This supports earlier research that demonstrated receiving positive information through word-of-mouth early in the recruitment process is positively related to perceived organizational attractiveness and actual recruitment.[33] Within the business literature, this phenomenon is called the accessibility-diagnosticity model. The model suggests that information provided through word-of-mouth affects potential recruits' early evaluations of the organization because of its accessibility in memory and its feedback potential.[34,35] That is, if a physician receives positive word-of-mouth information on a given program or

organization they are more likely to think favourably when asked at a later date to perform a volunteer activity. This finding has clear practical implications for practice in that organizations should try to stimulate positive word-of-mouth early in the recruitment process because of its positive impact on potential recruits' attraction to an organization and subsequent retention.

Long-standing ACES volunteers take careful measures to select, and subsequently recruit new members. In turn, this recruitment effort has a significant impact on long-term retention. The majority of physicians recruited become committed to the ACES program and have long-term sustainability as volunteers. We have found that a key to this commitment and sustainability lies in the strength of the social networks among volunteer physicians. Research on teams in which dyads are found within larger groups of people (e.g., ACES volunteer physicians within the larger medical community) suggests that people are likely to collaborate with others who possess qualities and skills, and know-how that are complementary to their own and relevant to reaching a particular objective.[36] Interestingly, we found that many of the new recruits were already well known to at least several of the ACES physician volunteers, and thus were already in their educator network. This supports the notion that people are inclined to create relationships with friends of their friends (or the business associates of their business associates). The effect of sharing mutual acquaintances on attachment appears to be additive in that each additional mutual acquaintance shared by an unconnected dyad (relationship) additionally increased the likelihood that they will become acquainted.[37] Perhaps the reason for the excellent retention and deep commitment of ACES physician volunteers is explained by

the structure of the ACES social networks which comprises many third party connections. Research states that ties connecting people who share several common third party connections are more likely to withstand the test of time.[38,39] As related to our conceptual framework, we understand that physician volunteers exercise both emotional (intrinsic commitment & loyalty) and cognitive (intellectual challenge & constant change/growth) engagement that directly relate to the retention of volunteers.[40,41]

Personal satisfaction was an overarching finding that mapped directly to the emotional and cognitive elements of engagement within the conceptual framework. Our study has shown that financial incentives are of low to absent value to physician volunteer engagement in all activities within the ACES program. The emotional and cognitive rewards coupled with reciprocal engagement were key elements. In addition, the organizational culture provided the basis for successful engagement. The need to enhance scholarly recognition was identified. Literature supports that the internal motivation is a strong driver of volunteer teacher participation.[9] The high value placed on personal satisfaction appears to be consistent across a variety of contexts. This domain of personal satisfaction can be further broken down into the emotional, cognitive and reciprocal form of engagement and mapped to our conceptual framework. In particular, physicians felt a strong sense of cognitive engagement with regard to being 'pushed' out of their comfort zone so as to reach a new and expanded state of performance.[42,43]

We found workload and increased external demands to be a threat to physician volunteer activities. Yet, in the ACES group we identified healthcare professionals that have

remained engaged despite considerable external demands. In fact, most volunteers interviewed in this program would contribute further if called upon. The high level of engagement of these individuals is complex and involves many elements of the conceptual framework. In some circumstances, when other demands increased, volunteers modified their role and mentored new leaders, allowing for ongoing engagement. Moving away from traditional 'individual' leadership theories, team leadership theory includes the concept of team leadership capacity, which includes the entire range of the team's leadership.[44] It appears that the ACES organizational structure has capitalized on this distributed shared leadership approach to ensure sustainable and diversity of available leaders.

Limitations

There are several limitations to our study. It was a cross-sectional study, performed in a single context of highly engaged health care professionals most of whom were located at academic teaching hospitals. The nature of engagement within the organization may be context specific. Further studies are required to determine the transferability our findings to other contexts. In our study, we sought perspectives from volunteers performing various tasks. However, given the sample size it is not possible to determine if the underlying components of engagement change with variation in the roles. Further, we did not examine the time spent volunteering (e.g., hours/weeks per year) nor did we seek out individuals who may have volunteered but later completely withdrew. We will ensure to capture this data in our future work. Finally, when the volunteer role includes teaching, we identified that the reciprocal engagement between the student and teacher

adds to the overall engagement of the volunteer. This component was not in our conceptual framework and could be added in future investigations where the volunteer role includes teaching.

Future Research

The presumption that engagement is malleable is an exciting prospect.[45,46] A cohesive framework is required to facilitate understanding of the complex construct of volunteer physician engagement and this framework can be utilized in the development of multifaceted approaches to enhance volunteer physician engagement. For example, an intervention may include enhancing reciprocal engagement through collaborative meetings and enhancing interpersonal relationships; emotional engagement by connecting with individuals on a deeper level with respect to the meaning and potential outcomes of their work; cognitive engagement by including intellectually challenging tasks, and recognition of the volunteers work through faculty appointment, newsletters among their peers, awards and scholarly acknowledgement. Further research is also required to determine how we measure engagement. The conceptual framework presented in this paper may aid in the design of measurement tools. The strategies and tools may vary depending on type of volunteer activity and setting. Furthermore, research is required to explore the construct of disengagement, to determine if different professional "identities," such as nurses, respiratory therapists, administrators, have different facilitators and inhibitors to engagement. Future studies may also explore if volunteer participation impacts an individuals' clinical practice or career path.

Conclusion

Volunteer physicians are essential to the growth and sustainability of the ACES program. This organization has demonstrated great success with engaging highly effective volunteers. Our conceptual framework and qualitative findings provide a preliminary framework as an important initial step in understanding the complex construct of volunteer physician engagement. This study will guide us in our development of a multifaceted intervention, aligned with the conceptual framework, to enhance volunteer physician engagement within the organization. Finally, given the current economic climate, providing compensation to physicians for additional education related activities may not be financially feasible or sustainable so alternative approaches must be explored to engage volunteer physicians.

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Study concept and design: Sarti, Sutherland, Landriault, DesRosier, Brien, Cardinal
Acquisition of data: Sarti, Sutherland, Landriault, DesRosier
Analysis and interpretation of data: Sarti, Sutherland, Landriault, Cardinal
Drafting of the manuscript: Sarti and Sutherland
Critical revision of the manuscript for important intellectual content: Sarti, Sutherland, Landriault, DesRosier, Brien, Cardinal
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List of Figures:

List of Tables:

List of Supplemental Online Content

Appendix S1. Interview Guides.

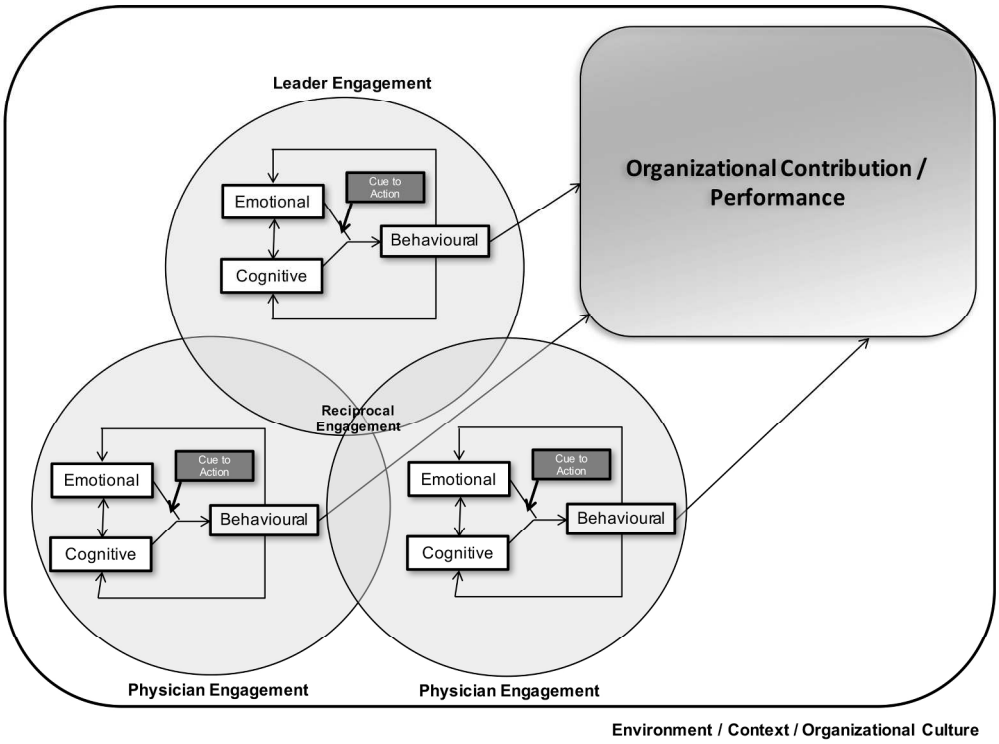

Figure 1. Conceptual Framework

215x161mm (300 x 300 DPI)

Table 1. Characteristics of interview participants.

Characteristic	n	%
Number	30	
Region *		
Mountain	7	23
Prairies	3	10
Ontario	14	47
Quebec	2	7
Atlantic	4	13
Specialty/Discipline **		
Critical Care	23	77
Anesthesia	7	23
Internal Medicine	5	17
Surgery	3	10
Family Medicine	3	10
Nurses	2	7
Respiratory Therapists	2	7
Pediatric Critical Care	1	3

** The regions of Canada have been divided in the following way: Mountain includes British Columbia and Alberta; Prairies include Saskatchewan and Manitoba; Atlantic includes all Atlantic Provinces.*
*** Individuals were classified under their current practice specialties. Note that an individual may be practicing in more than one specialty.*

Table 1. Characteristics of interview participants.

279x361mm (300 x 300 DPI)

Table 2: Summary of the qualitative findings.

1. Volunteer Recruitment
a. Word of mouth
b. Snowball approach
c. Career stage
2. Volunteer Retention
a. Distributed leadership and career paths
b. Program change and evolution/innovation
c. Comfort zone
d. Reciprocal engagement
e. Intrinsic motivation
f. Learners
g. Barriers
3. Volunteer Exchange
a. Career opportunities
b. Keep current
c. Academic currency
4. Volunteer Recognition
a. Personal recognition
b. Scholarly/academic work
5. Educator Network
a. Common vision
b. Duration or participation/loyalty
c. Affect
6. Quasi Volunteerism
a. Academic pressure
b. Curriculum vitae

Table 2. Summary of the qualitative findings.

279x361mm (300 x 300 DPI)

Interview Guide 1

Introduction

1. Introduction
   Thanks for agreeing to participate … We are conducting a needs assessment for the ACES course (introduce the project). Consent.

2. Background
   a. Goal of the ACES course - provide the learner with the necessary knowledge, skills and attitude to recognize and manage a patient who is acutely and critically ill in the first hour of presentation
   b. Modality of the ACES course - multimodal: e-learning, book, case seminars, technical skill workshop, simulation, and bedside tools
3. Purpose of the needs assessment
   a. Interest expressed by various groups to customize the ACES course to a specific population
   b. Facilitate the dissemination of the course across Canada
   c. Exploring interest in an interprofessional course
   d. Explore business models that would facilitate dissemination
   e. Explore peer-review process and means of promoting academic contributions of faculty
4. Please let us know if you are NOT in a position to answer some of the questions (e.g. vice-dean discussing weaknesses of residents during resuscitation)
5. Interview will be recorded; all information will be kept confidential

Demographics

1. What is your professional designation?
2. What are your current roles?
3. Can you let me know what type of institution you work in (Community Hospital, Secondary, Tertiary, and Quaternary)?
4. When it comes to responding to a crisis, what is the usual makeup of the team in your institution?
5. Are you familiar with the ACES course? Have you participated or taught an ACES course?

Content

1. When it comes to responding to a crisis, what are the team's strengths?
2. When it comes to responding to a crisis, what are team's weaknesses?
3. Probes
   a. What about (mention any members of the team that have not been addressed)

4. At the end of the course, the learner should be able to…….. (Please list the 5 most important performance objectives)
5. Is there anything else that you can think of that we have not discussed?

Course format

1. Do you think that pre-course on-line content would be useful?
    a. Do you anticipate that you or your learners may have any problems accessing online material?
    b. What is the purpose of having pre-course on-line content?
        i. Teaching knowledge, decision-making, other?
        ii. Preparation for the face-to-face course
        iii. Assessment of learners?
        iv. Others
    c. What should be the duration of a pre-course on-line session?
    d. Should the pre-course on-line content be mandatory?
        i. If so, can you think of ways to ensure your or your learners compliance with mandatory online content?

2. Do you think that post-course on-line content would be useful?
    a. Would it be useful for you to have access to the pre-course on-line content after the course for further revision? How long?
    b. What is the purpose of having post-course on-line content?
        i. Teaching knowledge, decision-making, other?
        ii. Preparation for the face-to-face course
        iii. Assessment of learners?
        iv. Post-course assessment of knowledge retention
        v. Others
    c. What should be the duration of an on-line session?
        i. Post face-to-face course
    d. Should post-course on-line content be mandatory?
        i. If so, can you think of ways to ensure your or your learners compliance with mandatory online content?

3. Do you think that the program should have a face-to-face course?
    a. How long should the course be?
    b. What should be the preferred modalities?
        a. Simulation?
        b. Case-based seminars?
        c. Technical skills workshops?
        d. Didactic lecture?

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        e. Other?
    c. What should be the relative proportion of time spent for each modality?
        a. Simulation?
        b. Case-based seminars?
        c. Technical skills workshops?
        d. Didactic lecture?
        e. Other?
    d. Should the pre-course material be reviewed during the face-to-face course?
    e. What should determine the instructor to participant ratio?
        a. Simulation?
        b. Case-based seminars?
        c. Technical skills workshops?
        d. Didactic lecture?
        e. Other?
    f. Tell me what you think about making this course interprofessional…
        a. What would be the advantages?
        b. What would be the challenges?

4. How complicated is it for your institution/organization to organize a course that contains a large components of simulation training?
    a. Do you have access to simulation laboratory with the required equipment?
    b. Do you have access to simulation engineer
    c. Do you have trained instructors
    d. Do you have course co-coordinators with experience delivering such courses

Market analysis

1. What do you like most about the ACES course?
2. What changes would most improve the ACES course?
3. Do you know of competing courses currently available?
4. What do you like the most about these other courses?
5. What changes would most improve these other courses?
6. If you are not likely to deliver the ACES course, why not?
7. What would make you more likely to deliver the ACES course?
    a. Is costing an issue?
    b. Are difficulties delivering the ACES course an issue?
        i. Low participants to instructor ratio
        ii. Space
        iii. Equipment

iv. Personnel (simulation engineer, trained actors, course coordinator)

8. Imagine that you are tasked to widely disseminate this course in order to improve patient care. Can you think of a business model that would favor wide dissemination?
    a. Keeping in mind that there is a cost related to the development and dissemination of the material.

Peer review process

1. Do you have any suggestions on how to best organize and facilitate the peer-review process?
    a. Initially
    b. On an ongoing process

Recognition

1. How could the Royal College best recognize your or your institution's contributions in the creation and delivery of the ACES course?
    a. Would it help if creators were informed of their material evaluations and extent of dissemination? How often?
    b. Would including the sums invested in the completion of the project be useful as a means of recognition?

Interview Guide 2

Volunteer Engagement in the ACES program

- Target – Leadership within the organization and some Volunteer Physicians
- Introduction, Confidentiality, Consent

Leadership Questions:

1. What is your role in the ACES program?
2. How do volunteers impact the program? Has this changed over the years / history of the program?
3. Who are the volunteers?
4. Where are they located?
5. What roles do volunteers perform?
    a. *Probe – development, delivery, administration, promotion of the program, etc. Specifically link to the conceptual framework*
6. Are there more ways that you envision them being involved?
7. Why do you think physicians volunteer their time with the ACES program?
    a. *Probes: To be completed -*
        i. *Behavioural*
        ii. *Emotional*
        iii. *Cognitive*
            1. *The challenge of the activity? Or mastering challenging / difficult ideas/skills/tasks?*
8. How are they currently recruited?
9. What are the barriers to recruitment and retention of volunteers?
10. What are the facilitators to recruitment and retention of volunteers?
11. How are they rewarded/appreciated for their contribution?
12. How do you see the ACES program evolving and how will this impact the volunteers? Impact the need for volunteers?
13. If a need for more volunteers is identified - Any solutions to increasing capacity and retention?

Questions regarding your volunteer involvement

14. Do you volunteer time with the ACES program?
15. What activities / role do you perform as a volunteer?
16. Why do you volunteer?
17. How is your contribution acknowledged?

Volunteer Questions:

1. What is your role in the ACES program?
2. How long have you been a volunteer with ACES?
3. How did you become involved with ACES?
4. Why do you volunteer?
    a. *Probes:*
        i. *Behavioural*
        ii. *Emotional*
        iii. *Cognitive*
            1. *Do find this work challenging? by the activity and or your involvement? Or mastering challenging / difficult ideas/skills/tasks?*
    b. What specifically – ie, what part is challenging? What part do you 'love'? what part are you most 'interested' in?
5. Have you ever considered increasing your involvement with ACES?
6. Have you ever considered decreasing or discontinuing your involvement with ACES?
7. Are there factors that maintain your involvement with ACES?
8. What improvements could be made to better meet your needs as a volunteer with the organization?

COREQ Checklist for Qualitative Study.

Domain 1: Research team and reflexivity

Personal Characteristics

1. Interviewer/facilitator - Which author/s conducted the interview or focus group? (P.10)

- A.S., S.S., A.L.

2. Credentials - What were the researcher's credentials? (P.1)

- A.S.: MD, MEd
- S.S.: PhD
- A.L.: RN, BScN.

3. Occupation - What was their occupation at the time of the study? (P.1)

- A.S. – Intensivist / Clinical Scholar, The Ottawa Hospital; Clinician Investigator in the Clinical Epidemiology Program (CEP) at the Ottawa Hospital Research Institute (OHRI)
- S.S. Research consultant for The Department of Critical Care, The Ottawa Hospital
- A.L. – Instructional/Curriculum Designer at the Royal College of Physicians and Surgeons of Canada; practicing Critical Care nurse in a tertiary Intensive Care Unit

4. Gender - Was the researcher male or female? (P.1)

- All researchers (data collection, coding/data analysis) were female

5. Experience and training - What experience or training did the researcher have? (P.27)

- A.S. was in her second year of a clinical scholars' program. She completed a fellowship with the Academy for Innovation in Medical Education at the University of Ottawa, and was a Masters of Health Professionals Education Candidate, University of Dundee, Scotland. She had performed numerous qualitative and mixed method investigations.
- S.S. has expertise in mixed methods research with an MA (Hons.) in measurement and evaluation, and a PhD in educational research, with 20 years of research and evaluation experience.
- A.L. has gained experience in conducting needs assessment (using interviews, focus groups and walkthrough) for the development of educational material as part of her occupation and was in the process of completing her Masters of Education (MA Ed) which included graduate level courses in qualitative methods. She had also received training in interviewing skills.
- Co-authors experienced in both quantitative and qualitative research, medical education, palliative and critical care.

Relationship with participants

6. Relationship established - Was a relationship established prior to study commencement? (P. 10)

- No.

7. Participant knowledge of the interviewer - What did the participants know about the researcher? (P.10)

Participants were aware of the rationale for the study and the researcher's level of training. 8. Interviewer characteristics - What characteristics were reported about the interviewer/facilitator? (P.27)

- The interviewer's level of training and occupation were reported (see Contributors section).

Domain 2: Study design (P.7)

Pre-structured qualitative research design

9. Methodological orientation and Theory - What methodological orientation was stated to underpin the study? (P.7)

- Qualitative study guided by a conceptual framework.

Participant selection

10. Sampling - How were participants selected? (p.9)

- Purposive sampling.

11. Method of approach - How were participants approached? (P.9)

- Email and telephone.

12. Sample size - How many participants were in the study? (P.11)

- 30 interviews

13. Non-participation- How many people refused to participate or dropped out? Reasons? (P.11)

- Participation and non-participation rates provided (30 of 33 individuals participated). It can be noted that due to external time demands, 3 of the potential participants could not be interviewed during our data collection time window.

Setting

14. Setting of data collection - Where was the data collected? (P.10)

- Telephone interviews

15. Presence of non-participants Was anyone else present besides the participants and researchers?

- No

16. Description of sample - What are the important characteristics of the sample? (P. 11 & 12)

- Secondary qualitative analysis was undertaken on fifteen semi-structured interviews with participants, including program directors and health care professionals across Canada. An additional fifteen interviews with physician volunteers were conducted to achieve thematic saturation. Important sample characteristics included health care provider role and geographic location.

Data collection

17. Interview guide - Were questions, prompts, guides provided by the authors? Was it pilot tested? (Appendix S1), and P. 10

- Semi structured guides were developed for the focus groups, interviews, and walkthroughs, with probes to guide as necessary. All tools were pilot tested prior to use in this study.

18. Repeat interviews - Were repeat interviews carried out?

- No.

19. Audio/visual recording - Did the research use audio or visual recording to collect the data? (P. 10)

- Interviews were audio recorded and transcribed.

20. Field notes - Were field notes made during and/or after the interview or focus group? (P. 10)

- Yes, both during and after.

21. Duration - What was the duration of the interviews or focus group? (P. 10)

- Interviews lasted from 40 to 60 minutes.

22. Data saturation - Was data saturation discussed? (P. 11)

- Yes

23. Transcripts returned - Were transcripts returned to participants for comment and/or correction?

- No, the transcripts were not returned to the participants. To ensure accuracy of transcriptions, each transcript was verified with the audio recordings prior to data analysis.

Domain 3: Analysis and findings

Data analysis

24. Number of data coders - How many data coders coded the data? (P. 10)

- Three researchers coded the data

25. Description of the coding tree - Did authors provide a description of the coding tree? (P. 10)

- No. Available upon request but we did mention the creation of it in the manuscript.

26. Derivation of themes - Were themes identified in advance or derived from the data? (P. 10)

- Inductive – Themes were derived from the data

27. Software - What software, if applicable, was used to manage the data? (P. 10)

- Yes, NVIVO

28. Participant checking - Did participants provide feedback on the findings? (P. 11)

- No

Reporting

29. Quotations presented - Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? (P. 13,14,15,16,17,18 & 19)

- Yes, participant quotations were presented to illustrate the themes presented. No, each quotation was not identified so as to maintain assurances of confidentiality and anonymity.

30. Data and findings consistent - Was there consistency between the data presented and the findings? (P. 12)

- Yes, the quotes explicate the themes as presented.

31. Clarity of major themes - Were major themes clearly presented in the findings? (P. 13)

- Yes, the major themes are presented throughout the results section with representative quotes.

32. Clarity of minor themes - Is there a description of diverse cases or discussion of minor themes? (P. 12)

- Yes, we have provided the name of the main theme along with the associated sub themes, and have explicated these within the results section.