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The Impact of CPR Training Workshops on Knowledge, Confidence, and Healthcare Career Interest in Rural British Columbia Youth

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Abstract

Rural British Columbia (BC) communities have limited access to life-saving emergency care during out-of-hospital cardiac arrest, resulting in lower survival rates than urban areas. The Rural CPR Outreach Programme (RCOP) aims to address these disparities by improving bystander CPR literacy among high school students in rural BC.

Free one-hour CPR workshops were conducted in three rural communities in the BC Interior. Pre- and post-workshop surveys captured changes in participants' CPR knowledge, confidence, perceived importance, and interest in healthcare careers.

Across eight workshops, a total of 168 surveys were collected. Students recognized the importance of CPR despite low rates of previous CPR training and awareness of local training. The RCOP workshops increased students' knowledge and confidence in performing CPR. No change in career interest was reported.

The RCOP highlights the necessity, effectiveness and potential benefits of low-barrier CPR training initiatives in rural BC high schools and their communities.

Keywords: CPR training, AED training, rural, education, outreach

Impact des ateliers de formation en RCR sur les connaissances, la confiance et l'intérêt pour les carrières en santé chez les jeunes des régions rurales de la Colombie-Britannique

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Résumé

Les communautés rurales de la Colombie-Britannique (C.-B.) ont un accès limité aux soins d'urgence vitaux en cas d'arrêt cardiaque extrahospitalier, ce qui se traduit par des taux de survie inférieurs à ceux des milieux urbains. Le programme de sensibilisation à la RCR en milieu rural (PSRR) vise à réduire ces inégalités en améliorant les connaissances des élèves du secondaire en matière de RCR.

Des ateliers gratuits d'une heure sur la RCR ont été organisés dans trois communautés rurales de l'intérieur de la Colombie-Britannique. Des sondages menés avant et après les ateliers ont permis de mesurer l'évolution des connaissances des participants en matière de RCR, leur confiance, l'importance qu'ils en accordent et leur intérêt pour les carrières en santé.

Au total, 168 questionnaires ont été recueillis lors des huit ateliers. Les élèves ont reconnu l'importance de la RCR malgré le faible taux de formation antérieure et la méconnaissance des formations locales. Les ateliers du PSRR ont accru les connaissances et la confiance des élèves en matière de RCR. Aucun changement n'a été constaté quant à l'intérêt pour les carrières en santé.

Le PSRR souligne la nécessité, l'efficacité et les avantages potentiels des initiatives de formation à la RCR à faible barrière accessibles à tous dans les écoles secondaires rurales de la Colombie-Britannique et dans leurs communautés.

Mots-clés : formation à la RCR, formation à l'utilisation d'un DEA, milieu rural, éducation, sensibilisation

1.0 Introduction

In Canada, approximately 60,000 cardiac arrests occur outside hospital settings each year (Heart and Stroke Foundation of Canada, 2025). These events, referred to as out-of-hospital cardiac arrests (OHCA), have lower survival rates, largely due to delays in emergency care and limited early intervention (Orkin et al., 2017). For individuals living in rural communities, access to emergency services is further complicated by longer Emergency Medical Services (EMS) response and transport times (Alanazy et al., 2019; Park et al., 2018; Peters et al., 2023). Consequently, Canada experiences a stark disparity in survival rates between urban centres and rural areas (Connolly et al., 2022).

Since studies have shown that bystander cardiopulmonary resuscitation (CPR) increases the rate of OHCA survival (Kragholm et al., 2017; Yan et al., 2020), the American Heart Association recommends early defibrillation and bystander CPR as measures to improve survival rates of OHCA (Magid et al., 2020). In addition, the Canadian Heart and Stroke Foundation recognizes an increased need for CPR and automated external defibrillator (AED) training in rural communities (Khatib et al., 2024). Unfortunately, in rural communities, this training is often not accessible due to location and limited financial resources.

Public health education initiatives have been proposed as accessible and cost-effective solutions for addressing rural OHCA outcomes (Abelsson et al., 2020; Kalluri et al., 2018; Pivač et al., 2020; Tsai et al., 2019; Vaillancourt et al., 2021). Specifically, educational programs that facilitate training rural populations in bystander CPR, increase AED availability, and improve EMS response time are the most promising strategies (Vaillancourt et al., 2021). Studies on free educational workshops have demonstrated their effectiveness in improving bystander CPR knowledge and awareness among students (Abelsson et al., 2020; Kalluri et al., 2018; Pivač et al., 2020; Tsai et al., 2019). These workshops resulted in significant increases in CPR knowledge, awareness, and confidence in both elementary (Pivač et al., 2020) and secondary school students (Abelsson et al., 2020; Kalluri et al., 2018; Tsai et al., 2019). These findings strongly support the implementation of free educational workshops as an effective method for enhancing bystander CPR skills and confidence.

In BC, the Rural CPR Outreach Programme (RCOP) is the only initiative focused on increasing bystander CPR literacy rates among rural high school students. A research group on Vancouver Island initially conducted RCOP workshops in 2022 and demonstrated its effectiveness to enhance CPR knowledge and increase students' perceived comfort in performing CPR (Bene Watts et al., 2024). They also revealed that 72% of student participants had no previous CPR training; however, it is unclear whether these findings are generalizable to the rest of the province or if participating in the RCOP influences students' interest in pursuing healthcare careers (Bene Watts et al., 2024).

In 2024, our research group expanded the RCOP to include the BC Interior. Our study aimed to build on the work of our colleagues by investigating changes in participants' confidence in performing CPR before and after the workshop, assessing their awareness of additional CPR training resources in their communities, and evaluating the feasibility of delivering bystander CPR workshops as a cost-effective, low-barrier approach to increasing CPR literacy. Additionally, we explored students' perspectives on the importance of CPR

training and whether participating in the RCOP sparked an increased interest in pursuing healthcare careers among the students. We hypothesized that implementing a low-cost rural CPR program in Interior BC, led by medical students, would be effective in improving their knowledge and confidence in CPR and increase their interest in healthcare careers.

2.0 Methods

2.1 Population

The population for this study included high school students from three rural communities, Revelstoke, Cranbrook, and Kimberley, in the Kootenay region of British Columbia. The Kootenay region is one of eight district regions in British Columbia and has a population of over 160,000 (Statistics Canada, 2023). We utilized a proximity-based approach when selecting which schools to attend. We identified several centers within the Kootenay region and invited high schools near each center. We attended schools that expressed interest in our program on a first-come, first-served basis. The workshops were delivered at Revelstoke Secondary School, Mount Baker Secondary School, and Selkirk Secondary School. Written consent was obtained from both local and district administrative staff prior to workshop delivery. Appropriate oral consent was also obtained from participants on the day of the workshop.

2.2 Workshop Design

Educational one hour bystander CPR and AED workshops were delivered by four medical students in a classroom setting during school hours. The workshops consisted of a one-hour slideshow presentation, followed by an interactive small group session. The workshops used updated materials from the RCOP workshops conducted on Vancouver Island (Bene Watts et al., 2024). The presentation outlined the main steps of bystander CPR, AED use, common causes for cardiac arrest, and highlighted the importance of CPR in increasing survival rates. Video examples and live demonstrations of effective bystander CPR were also included in this portion. The interactive small group session paired each presenter with a group of four to six students. Each student was given the opportunity to demonstrate one minute of effective bystander CPR in addition to AED application using the Little Anne and AED Trainer Kit by Laedral (Treat, 2009). Visual feedback for each compression (rate and depth) was given via the QCPR app (Masuda et al., 2024).

2.3 Survey Design

We developed a survey to capture participants' CPR knowledge, confidence, perceived importance, and interest in pursuing a healthcare career, as shown in Figures 1 and 2. Our survey expanded on the previous RCOP survey conducted on Vancouver Island, which was adapted from the American Heart Association's CPR in Schools Questionnaire. This prior survey primarily focused on evaluating participants' knowledge of CPR and their comfort performing it (Bene Watts et al., 2024). Our survey was divided into three sections: (1) knowledge test, (2) scaled questions, and (3) multiple-choice questions. Demographic information was not collected. In the knowledge test section, participants were asked to identify key points that were taught in the workshop. This was used to measure the effectiveness of the workshop and to determine if key concepts were retained.

The scaled questions were delivered using the Likert scale (1-strongly disagree, 2-disagree, 3-neutral, 4-agree, and 5-strongly agree) and measured the participants' confidence in performing CPR, attitudes towards CPR, interest in healthcare or medicine as a career, and knowledge of local CPR training programs. The multiple-choice section assessed students' awareness of availability of CPR training in their community.

Figure 1: Pre-workshop assessment and survey questions.

Survey Questions: Pre-Workshop Assessment

1. Have you ever taken a CPR course?

□ Yes □ No

2. What is the first thing you do if you find someone unresponsive?

Answer: _____

3. For the following statements, please indicate the extent to which you agree or disagree.

Statement	Strongly Disagree	Disagree	Neutral	Agree
I am confident in performing CPR	□	□	□	□
I believe CPR is an important skill to know	□	□	□	□
I am interested in a career in healthcare	□	□	□	□
I know where to get CPR training in my community	□	□	□	□
I am interested in a career in medicine	□	□	□	□

4. Is there CPR training available in your community?

□ Yes □ No □ I don't know

Figure 2: Post-workshop assessment and survey questions.

Survey Questions: Post-Workshop Assessment

1. Have you ever taken a CPR course?

□ Yes □ No

2. What is the first thing you do if you find someone unresponsive?

Answer: _____

3. For the following statements, please indicate the extent to which you agree or disagree.

Statement	Strongly Disagree	Disagree	Neutral	Agree
I am confident in performing CPR	□	□	□	□
I believe CPR is an important skill to know	□	□	□	□
I am interested in a career in healthcare	□	□	□	□
I know where to get CPR training in my community	□	□	□	□
I am interested in a career in medicine	□	□	□	□

4. Is there CPR training available in your community?

□ Yes □ No □ I don't know

2.4 Survey Administration and Collection

A quantitative survey measuring participants' attitudes towards CPR was delivered at the beginning and end of each CPR workshop session. This survey was used to measure the participants' change in CPR knowledge and interest in a healthcare career after attending our workshop. To allow for comparison between pre- and post-workshop survey results, both surveys were included on the same piece of paper (2-sided, one side for each survey). Survey collection and data collection were anonymized. Survey completion was not mandatory, and students were allowed to participate in the workshop regardless of their survey completion.

2.5 Data Collection and Analysis

Prior to the data collection process, we established a clear marking rubric to limit reviewers' biases. Participants completed the pre- and post-workshop surveys on paper, which required manual marking and data entry. We had three reviewers mark each survey, and a fourth reviewer input the data into a spreadsheet. Data analysis was conducted using both IBM SPSS Statistics version 25 (Repeated measures ANOVA for changes in Likert-scale items) and Microsoft Excel. Partially completed survey responses were kept but not used in the data analysis for questions that asked for pre- and post-workshop answers. Blank or illegible responses on surveys were not included in data analysis.

2.6 Outcomes

The primary outcomes of this study were to assess changes in participants' CPR knowledge, confidence, and perceived importance of CPR following the workshop. Knowledge was evaluated through pre- and post-workshop questions on key CPR concepts, while confidence and perceived importance were measured using Likert-scale questions. Secondary outcomes included examining changes in students' interest in pursuing healthcare careers and their awareness of local CPR training resources, both assessed through pre- and post-workshop surveys. These outcomes provided insight into the effectiveness of the workshop in improving CPR literacy and its potential influence on career aspirations.

2.7 Ethical Considerations

The study was approved by the UBC Research Ethics Board, REB #H24-00920.

3.0 Results

Eight CPR workshops were delivered over a one-week period across three public secondary schools in rural interior British Columbia. Participating schools had student populations ranging from approximately 380 to 1,000 students. Workshops were initially offered to Grade 11–12 science and physical education classes, with subsequent invitations extended to any available classes. In total, ten classes participated in the eight workshops. A total of 168 students in Grades 10–12 attended the workshops and completed surveys. No students declined to participate on the day of the workshop or refused to complete the survey. Of these students, fewer than one-third (29.5%, 46/156) reported having previously participated in a CPR course.

Students demonstrated a high baseline level of CPR knowledge prior to the workshop. When asked to identify the first action to take upon finding an unresponsive individual, 83.3% (130/156) of students answered correctly on the pre-workshop survey, with a similar proportion responding correctly following the workshop (81.3%, 135/166) (see Table 1).

The workshop was associated with a significant increase in students' self-reported confidence in performing CPR. Mean Likert-scale confidence scores increased from 2.58 pre-workshop to 4.08 post-workshop ($p < .001$) (see Table 1). Students rated CPR as a highly important skill both before and after the workshop, with no significant change observed (pre-workshop mean 4.60 vs post-workshop mean 4.69).

Interest in healthcare- or medicine-related careers did not change because of workshop participation (see Table 1). Mean Likert-scale scores for interest in a healthcare career were 2.79 pre-workshop and 2.81 post-workshop, and interest in a

career in medicine remained similarly unchanged with a pre-workshop mean of 2.70 and post-workshop mean 2.76.

Awareness of CPR training opportunities was limited at baseline. Prior to the workshop, 50.0% (69/138) of students reported awareness of CPR training being offered within their community.

Of the 2,688 individual survey responses collected across the pre- and post-workshop surveys, 153 responses (5.69%) were excluded from analysis due to being incomplete, illegible, or selecting more than one answer.

Table 1. *Pre-Workshop Versus Post-Workshop Survey Scores*

Survey Question	**Pre-Training (%)**			**Post-Training (%)**			
Q2: What is the first thing you do if you find someone unresponsive?							
	n = 156			n = 166			
Incorrect	26 (16.7)			31 (18.7)			
Correct	130 (83.3)			135 (81.3)			
Likert Scale Questions:	n	M	SD	n	M	SD	p†
I am confident in performing CPR	165	2.58	1.19	166	4.08	0.73	<.001
I believe CPR is an important skill to know	164	4.60	0.56	166	4.69	0.53	.634
I am interested in a career in healthcare	165	2.79	1.22	165	2.81	1.23	.139
I know where to get CPR training in my community	165	2.72	1.26	166	3.16	1.16	<.001
I am interested in a career in medicine	164	2.70	1.25	165	2.76	1.21	1.000

Note. Likert scale questions are shown as mean scores with standard deviations (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree)

CPR: Cardiopulmonary resuscitation

†Repeated Measure ANOVA with significance value p=0.05

4.0 Discussion

Previous investigations by our group have focused on demonstrating the effectiveness of the RCOP workshops on Vancouver Island (Bene Watts et al., 2024). We expanded on this work by implementing the workshop series in the Kootenay region and exploring high school students' attitudes. This included

changes in students' perceived importance of CPR, prior CPR training, knowledge of CPR training resources in their community and interest in healthcare careers.

Our study demonstrated a significant increase in students' knowledge and confidence in performing CPR following the RCOP workshop ($p<.001$). Additionally, we found that although students highly value CPR as an important skill (pre-training M=4.60, post-training M=4.69), only 29.5% had prior CPR training, and only 50% were aware of any local training resources. The effectiveness of these workshops and low CPR literacy rates among students are consistent with the previous findings from the RCOP on Vancouver Island (Bene Watts et al., 2024). These findings suggest that rural communities may benefit from the broader implementation of low-cost CPR training programs across the province.

No statistical difference was observed in students' interest in healthcare careers following the workshop. We had anticipated that exposure to the field, including discussions about various healthcare professions such as medicine, paramedicine, and nursing, would increase interest; however, the rates remained unchanged. While research indicates that healthcare exposure programs in rural communities can boost interest in healthcare careers (Zayas & McGuigan, 2006), this was a secondary outcome of the RCOP. It is possible that repeated exposure at the same schools would be needed to achieve the expected results.

4.1 Strengths of the Study

Our program highlights the advantages of student-led initiatives, which have been shown to operate with minimal resource requirements and at low cost while providing meaningful educational benefits for students (Abelsson et al., 2020; Kalluri et al., 2018; Pivač et al., 2020; Tsai et al., 2019; Bene Watts et al., 2024).

In addition, this study represents an important step in exploring rural high school students' perspectives on CPR training, a crucial factor to consider before implementing a large-scale provincial program.

This work contributes to the broader literature on CPR education in school-aged children by outlining a low-cost, student-led framework to improve bystander CPR knowledge and education in rural communities. This approach aligns with the global *Kids Save Lives* campaign, endorsed by the World Health Organization, which advocates for the integration of CPR training into school curricula and aims to increase bystander CPR rates worldwide (Böttiger & Van Aken, 2015).

4.2 Limitations

Our study focused on surveying CPR literacy rates among rural high school students in the Kootenay region, one of BC's eight district regions. These regions have their own unique geography, climate, economies, histories and cultural diversity, which may limit the generalizability of the findings to other regions. In addition, some students failed to respond to both the pre- and post-workshop surveys. This resulted in a decreased sample size as incomplete surveys were not included in the analysis. Additionally, demographic information was not collected from participants due to ethics approval conditions related to the involvement of minors. While this facilitated participation and ensured privacy, it limits the ability to examine whether CPR knowledge, confidence, or career interest varied by age, gender, or other sociodemographic factors. Future studies should consider collecting limited demographic data with appropriate safeguards to better

understand how CPR education outcomes may differ across subgroups within rural youth populations. Finally, the study did not include any long-term follow up and no information on the retention of CPR knowledge was obtained. To address this limitation, future studies could be conducted to assess the impact of repeated training over subsequent school years.

5.0 Conclusion

The Rural CPR Outreach Programme successfully improved rural high school students' CPR knowledge and confidence. Although the workshops did not notably boost interest in healthcare careers, further research is needed to assess this relationship with a larger sample size. The study's limitations, including its focus on a single district and the absence of long-term follow-up, indicate areas for future research that could strengthen understanding and implementation of CPR training across diverse rural communities. Overall, this initiative serves as an important step toward enhancing emergency preparedness and health literacy in rural British Columbia.

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