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Assessing CPR Training: The Willingness of Teaching Credential Candidates to Provide CPR in a School Setting

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ABSTRACT

Introduction: The study explores the anticipated willingness of teacher credential candidates at one California public university in the U.S. to perform cardiopulmonary resuscitation (CPR) or foreign body airway obstruction (FBAO) skills in a school setting. Objectives included (1) identifying reasons that credential candidates would elect or decline to perform CPR, (2) assisting schools to remediate cardiac/respiratory emergency preparedness, and (3) assessing CPR training courses to determine how they may influence teachers' willingness to perform CPR.

Method: Participants included 582 teacher credential candidates, who were 95.2% of those surveyed after completion of a health science course and CPR certification. Participants described their attitudes regarding the importance of CPR, the CPR training course, and their willingness to perform CPR in a school environment.

Results: Based upon chi-square analysis, an association was found between the willingness to perform CPR and the presence of any one concern regarding training, with 68.6% of those expressing concerns willing to perform CPR compared to 81.9% of those expressing no concerns ($p < .0005$). Participants certified multiple times stated that they were more likely to perform FBAO skills on both conscious (89% vs. 78.9%, $p = .025$) and unconscious victims (80% vs. 72%, $p < .001$), as were participants who believed CPR to be an important skill for teachers (76.9% vs. 43.5%, $p < .001$). Males were more likely to express willingness to perform CPR than females (84.6% vs. 72.1%, $p < .001$).

Conclusions: Attitudes regarding CPR training may influence teachers' willingness to perform CPR. Recommendations based on these findings include pedagogical changes to CPR curricula, focusing on the importance of CPR as a teacher skill and additional



time for hands-on practice. Future research should include U.S. and international participants from a broader geographic area and assessment of both learning and affective outcomes.

Keywords: Cardiopulmonary resuscitation, emergency preparedness, first aid, health, education, teachers, credential

Introduction

The health services component of a coordinated school health program should provide for school personnel's immediate response to the accidental injury and sudden illness of students. The successful implementation of emergency procedures in schools greatly depends upon established guidelines and thorough indoctrination of appropriate responses by all school personnel. Medical emergencies, including acute drug overdose, anaphylactic reaction to medications and insect stings, foreign body airway obstruction (FBAO), and head trauma can be associated with respiratory and cardiac related emergencies in school children.

There is some likelihood that teachers will be in a position to act as first responders for basic life support (BLS) procedures, including cardiopulmonary resuscitation (CPR). The State of California in the United States currently mandates that all applicants for an elementary or secondary teaching credential complete certification in adult, infant, and child CPR. Moreover, teachers act in loco parentis (as a substitute for parents) during the school day in matters relating to the health and welfare of children and youth. Although teachers are held to this general standard of care, as lay rescuers state statutes do not require teachers to perform CPR on a child in need. The fact that a school teacher may have a current CPR certificate does not ensure that this individual will elect to provide basic life support, if needed. Further, the CPR certificate does not legally obligate recipients to perform CPR. School teachers are not legally viewed as healthcare providers and, therefore, are still considered lay rescuers when it comes to providing emergency healthcare assistance (California Education Code, 2009; McIntyre, 1975, 1980).

In order to be employed in a faculty position in a California elementary and secondary public school, teachers must first be certified by the Commission on Teacher Credentialing. Upon completion of credential requirements for certification in California, a teacher may apply for and receive a California teaching credential (California Teacher Credential Requirements, 2009).

In addition to offering required courses for credential requirements, California State University Northridge (CSUN) offers required courses in adolescent and child health designed to satisfy health science coursework requirements for teacher credentialing. Successful course completion requires that teacher credential candidates complete an additional Red Cross or American Heart Association approved basic rescuer course in child, infant, and adult CPR through CSUN or any other organization that offers such a course. Although candidates are taught technical skills to perform CPR, their willingness to actually perform those skills in a school environment is unknown.

CPR Training

Some issues have been identified with respect to current CPR training. Current methods of CPR and Advanced Cardiac Life Support (ACLS) training have been faulted for a failure to apply principles of adult education (Nolan, 2001; Burton, 2002; Chamberlain et al., 2003), for a lack of realism, and having little relevance or value in the real-world setting (Reznek et al., 2002).



It could be argued that the failure to address the environment in which training occurs is one explanation for participants' poor retention of the skills they are taught.

One of the key limitations to effective CPR training is that CPR skills are rarely, if ever used in real-world situations. As noted by Kidd & Kendall (2007) in their review of ACLS training and experiential learning, resuscitation skills are generally taught using hypothetical situations. From an adult learning standpoint, the inability to test oneself in an actual cardiac emergency makes it difficult for a trainee to exercise metacognition with respect to his or her actual skill acquisition. Additionally, the chaotic nature of a true emergency, compared to the methodical and well-organized pace of the classroom environment, serves to further distance theory from reality, making it difficult for individuals to know how well they might perform CPR skills when actually needed.

An individual's intent to perform CPR subsequent to training can also be viewed from the perspective of the theory of planned behavior (Ajzen, 1991). In describing the theory of planned behavior, Ajzen et al. (2004) have suggested that, because intentions are an immediate antecedent to actual behavior, the likelihood that an individual will perform a behavior can be predicted to some extent by his or her willingness to perform the activity and mitigated by that individual's perceived degree of control. Intention to perform a behavior is influenced by three factors: the individual's attitudes toward the consequences of the behavior, how the behavior is likely viewed by others within the social environment, and other extant factors that can affect performance of the behavior (Ajzen, 1991). Ajzen suggests that the additional factor of perceived behavioral control further influences behavior, in that an individual's willingness may be influenced by his or her belief that the behavior can be successfully accomplished and result in the desired outcome (Ajzen, 2002). When applied to the performance of CPR, application of the theory would suggest that willingness to perform CPR may be influenced by the individual's belief that the rescuer will be successful in his or her efforts.

The problem addressed by this study concerns the willingness of teacher credential candidates to perform CPR in a school setting and the factors associated with teachers' stated willingness to perform CPR, as well as their perceptions of their ability to perform the procedure successfully. By better understanding how behavioral intent relates to perceptions of the CPR curriculum, recommendations can be made for improving curricula and the behavioral outcomes of participants. Additionally, little is known about how teachers' willingness to perform CPR relates to their past CPR experiences, their attitudes toward CPR training, and their demographic characteristics.

Literature Review

Although studies of willingness to perform CPR can be found with respect to physicians (Gross et al., 1998) and laypersons (Jelinek et al., 2001; Johnston et al., 2003; Lester et al., 2000; Roberts et al., 2000), little research can be found with respect to teachers' willingness to perform CPR in a school setting. Among non-teachers, willingness to perform CPR varies widely, depending upon the circumstances. In a study of high school students, 86% of whom were trained in CPR, only 43% of students were willing to perform mouth-to-mouth resuscitation while 55% were willing to perform chest compressions. Students were also found to be more willing to intervene on behalf of a child or family member, while relatively fewer were willing to act in a circumstance of blood, vomitus, or when the victim is an intravenous drug user (Hubble et al., 2003).

In a study of 800 lay CPR trainees four years after training, Lester et al (2000) found that 89% of first time trainees indicated that they would be willing to perform CPR when the circumstances of the collapse were not specified. The number fell to 40% when facial blood was present and 48% when the victim was a gay man. Horowitz & Matheny (1997) also found a relationship between willingness to perform CPR and the perceived appearance of the victim in a study of healthcare professionals enrolled in an



advanced cardiac life-support course. The percentage of participants willing to perform mouth-to-mouth resuscitation ranged from 21% if the victim was a homeless man to 94% if the victim was a parent or spouse. In a study of residents and attending physicians, Gross et al. (1998) found that just 2% would be willing to perform mouth-to-mouth resuscitation if the victim was a disheveled man lying on a sidewalk and up to 69% when the victim was a man previously complaining of chest pain in a restaurant and subsequently collapsed.

Although there are studies focusing on the general population and healthcare providers, research focusing on teachers and teacher credential candidates' willingness to perform CPR in a school environment is notably limited and serves to highlight the need for a study of teachers. Despite its focus on non-teachers, the existing body of research helps frame our study of teacher credential candidates.

Methods

Subjects

Data were obtained during fall 2002 through spring 2004 semesters at California State University, Northridge, a public university in southern California. Study participants consisted of teacher credential candidates enrolled in a health science course, required by the State of California for individuals who are pursuing teaching certification. Prior to data collection, the University's Human Subjects Committee was consulted. Given the nature of the survey instrument as an evaluation of the effectiveness of an existing curriculum, completion of the formal approval process was not required.

Survey Instrument

The survey instrument was developed by the investigators for purposes of this study. Face and content validity was strengthened using a review panel consisting of an elementary and a secondary classroom teacher, a school administrator, a district school nurse, and a school counselor. Panel members reviewed the instrument and revised items, as needed. The final instrument consisted of 19 items focusing on participants' demographics, attitudes toward their CPR/FBAO skills training, previous history in performing CPR, and self-reported willingness to perform CPR/FBAO skills in a school environment in the event of a cardiac or airway obstruction emergency. Given that the survey was completed immediately upon the conclusion of training, it was not expected that participants had yet encountered an opportunity to practice CPR/FBAO skills, therefore questions regarding willingness to perform CPR were stated in hypothetical terms.

Statistical Procedures

Statistical procedures included chi square analyses to determine associations between participants' stated willingness to perform CPR in a school setting and the independent variables of respondents' gender, the number of times the respondent had been CPR certified, and participants' perceptions of the importance of CPR skills for teachers. Statistical significance was tested using an alpha value of .05.



Results

Overall, 582 participants, representing approximately 95.2% of those surveyed, completed surveys and consent forms acknowledging that their participation was voluntary. The majority of respondents (84.4%) was female, and primarily aged 20 to 30 (64.4%). Forty-four percent of participants (254) had been certified in CPR only once and the remaining 322 had been certified two or more times. Additionally, most of the respondents (65.5%) were not currently employed as school teachers but were either engaged in full-time studies toward a credential or were employed in other occupations while pursuing studies toward a credential on a part-time basis. Among current teachers, 23.7% worked in elementary school settings, 5.4% in middle schools, and 5.5% in high schools.

Data indicated that 5.3% of the respondents had actually performed CPR in the past to aid a victim in need of resuscitation, with the majority having no prior experience with the actual resuscitation of a victim or having applied FBAO skills on a conscious or unconscious victim. Respondents' previous experiences performing FBAO skills and CPR are presented in Table 1.

Table 1: Respondents' Previous Experience Performing CPR or FBAO Skills

Previous Experiences	Frequency	Percent
Have ever resuscitated a victim:		
Yes	31	5.3%
No	549	94.7%
Total	580	100.9%
Have ever removed an airway obstruction from a conscious victim:		
Yes	57	9.8%
No	524	90.2%
Total	581	100.0%
Have ever removed an airway obstruction from an unconscious victim:		
Yes	16	2.8%
No	563	97.2%
Total	579	100.0%

The majority of participants (74.1%) reported that they were willing to perform CPR in a school setting, with the remainder either not willing or undecided. Similarly most participants reported that they would be willing to perform FBAO skills on either a conscious or unconscious victim, with more participants willing to perform the procedure on a conscious rather than an unconscious victim (80.4% vs. 73.4%) (Table 2).

When asked what concerns participants had regarding their CPR training, the principle concern, reported by 35.4% of the participants, was being exposed to too much information, followed by the belief that insufficient class time was provided (14.5%).

When asked to describe the perceived importance of CPR training, the vast majority of the respondents (91.7%) indicated that they perceived CPR skills as important. Approximately 57.4% of the respondents indicated that CPR should be required for teachers by the "state, schools, and school districts". Conversely, only 12% of respondents indicated that teacher CPR training should be left up to personal choice.



Table 2: Respondent Attitudes

Participant Attitudes	Frequency	Percent
Concern Over CPR Training		
No concerns	238	42.7%
Too much information	197	35.4%
Not enough time	81	14.5%
Inadequate student/instructor ratio	31	5.6%
Knowledge not presented clearly	10	1.8%
Total	557	100.0%
Perceive CPR Skills as Important for Teachers		
Yes	510	91.7%
Undecided	25	4.5%
No	21	3.8%
Total	556	100.0%
CPR Training Should be Required by:		
State governments, schools and school districts	316	57.4%
State governments,	101	18.3%
Personal choice	66	12.0%
Schools and school districts	39	7.1%
Undecided	29	5.3%
Total	551	100.0%
Would Have Difficulty Recalling Information from CPR Course:		
No	267	46.2%
Yes	189	32.7%
Unsure	122	21.1%
Total	578	100.0%
Would Have Difficulty Performing CPR Skills:		
No	285	50.2%
Yes	150	26.4%
Unsure	133	23.4%
Total	568	100.0%
Would Perform CPR in a School Environment:		
Yes	431	74.1%
Unsure	132	22.7%
No	19	3.3%
Total	582	100.0%
Would Perform FBAO Skills on a Conscious Victim:		
Yes	468	80.4%
Unsure	97	16.7%
No	13	2.2%
Total	578	100.0%
Would Perform FBAO Skills on an Unconscious Victim:		
Yes	427	73.4%
Unsure	125	21.5%
No	26	4.5%
Total	578	100.0%

Respondents were asked to self-assess whether they felt they would have difficulty in recalling information learned in their CPR course. Of those who responded to the question, 32.7% indicated that they would definitely have difficulty, while only 46.2% of participants indicated that they would have no difficulty in recalling information. Although nearly one-third of respondents felt they would have difficulty in recalling information from their CPR course, relatively fewer (26.4%) felt that they would have difficulty in actually performing CPR, while half indicated they would have no difficulty in performing CPR (Table 2).



The most frequently identified reason why respondents felt they would not perform CPR on an unconscious victim or FBAO skills on a conscious victim was concern about performing the procedures correctly. With respect to unconscious victims, the most frequently cited reason for not performing FBAO skills was a concern about legal repercussions, followed by a concern about incorrectly performing the procedure (Table 3).

Table 3: Frequency of Reasons for Unwillingness to Perform CPR or FBAO Skills

Reasons for not Performing CPR/FBAO Skills	FBAO Conscious Victim		FBAO Unconscious Victim		CPR	
	Number	Percent	Number	Percent	Number	Percent
Risk of contracting infectious disease	6	15.4%	12	20.7%	14	29.8%
Concerned about legal repercussions	9	23.1%	21	36.2%	8	17.0%
Concerned about incorrectly performing CPR	21	53.8%	18	31.0%	18	38.3%
Would be too panicked to act	2	5.1%	3	5.2%	6	12.8%
<i>Have physical limitations which would prevent taking action</i>	1	2.6%	4	6.9%	1	2.1%
Total	39	100%	58	100.0%	47	100.0%

Bivariate Analysis

Those who perceived CPR to be an important skill more often expressed a willingness to perform CPR than those who did not perceive it as an important skill (73.9% vs. 43.5%) ($p < .0001$). Similarly, a significant association was found between participants' willingness to perform CPR and the presence of at least one concern regarding CPR training. Of the respondents who cited at least one concern, only 68.6% reported that they would be willing to perform CPR, whereas 81.9% of those who cited no concerns reported that they would be willing to perform CPR ($p < .0001$).

With respect to gender, although 72.1% of females were willing to perform CPR, 84.6% of males reported that they would be willing to perform CPR ($p = .013$). A similar association with gender was observed with respect to performing FBAO skills on an unconscious victim, with 70.5% of females and 89% of males stating that they would be willing to do so ($p < .0001$).

A relationship was also observed between the number of times that a respondent was certified and the willingness of the participant to perform FBAO skills. Although 72.8% of respondents certified one time were willing to perform FBAO skills on a conscious victim, 85.1% of those certified two or three times were willing to perform the procedure, and 91.5% of those certified more than three times were willing ($p < .0001$). A similar association was found between the number of times respondents were certified and their stated willingness to perform FBAO skills on an unconscious victim ($p < .0001$).



Table 4: Analysis of Willingness to Perform CPR

	Willing to Perform CPR in a School Environment		
	Yes	No/Unsure	Total
Believe that CPR is an Important Skill for Teachers*			
Yes	392 76.9%	118 23.1%	510 100%
No/Unsure	20 43.5%	26 56.5%	46 100%
Total	412 74.1%	144 25.9%	556 100%
Presence of One or More Concerns Regarding Training †			
Yes	236 68.6%	108 31.4%	344 100%
No/Unsure	195 81.9%	43 18.1%	238 100%
Total	412 74.1%	144 25.9%	556 100%
Respondent Sex ‡			
Male	77 84.6%	14 15.4%	91 100.0%
Female	354 72.1%	137 27.9%	491 100.0%

* $\chi^2(1, N=556) = 24.5 p < .0005$

† $\chi^2(1, N=556) = 13.00 p < .0005$

‡ $\chi^2(1, N=491) = 6.261 p = .007$

Discussion & Recommendations

These findings suggest that various attitudes of teaching certificate candidates are associated with their willingness to perform CPR. Almost 23% of respondents were undecided about their willingness to perform CPR, suggesting that with the right interventions, they may be influenced to intervene in a medical emergency. Although this study cannot determine whether the perceived importance of CPR as a lifesaving skill for future teachers holds a causal relationship with willingness to perform CPR, an association is demonstrated. Given the degree to which some participants do not perceive CPR as being an important skill for teachers and given the possible influence of that perception on teachers' willingness to perform CPR, perhaps CPR courses designed for teachers should include a broader discussion of emergency procedures within the school environment and emphasize teachers' roles and responsibilities. In that light, CPR should be presented within the context of a coordinated school health program as a skill equal in importance to classroom instruction and assessment, along with other skills normally part of teacher preparation.

Given the relationship between participants' willingness to perform CPR and their concerns regarding CPR training, improvements in CPR curricula might also increase the likelihood that teachers will effectively use CPR/FBAO skills if the need arises. Additionally, CPR curricula might also benefit from a comprehensive evaluation that assesses not only learning outcomes related to performance of psychomotor skills, but also affective outcomes relating to the attitudes of trainees toward CPR.



Table 5: Analysis of Willingness to Perform CPR and FBAO Skills by the Number of Times Certified

	Willing to Perform CPR in a School Environment*			Willing to Perform FBAO Skills on a Conscious Victim†			Willing to Perform FBAO Skills on an Unconscious Victim‡		
	Yes	No/ Unsure	Total	Yes	No/ Unsure	Total	Yes	No/ Unsure	Total
Number of Times CPR Certified ‡									
One	181 71.3%	73 28.7%	254 100%	185 72.8%	69 27.2%	254 100%	174 68.5%	80 31.5%	254 100%
Two or three	173 75.9%	55 24.1%	228 100%	194 85.1%	34 14.9%	228 100%	173 74.9%	55 24.1%	228 100%
More than three	72 76.6%	22 23.4%	94 100%	86 91.5%	8 8.5%	94 100%	77 81.9%	17 18.1%	94 100%
Total	426 74.0%	150 26.0%	576 100%	465 74.1%	111 25.9%	576 100%	424 73.6%	152 26.4%	576 100%

* $\chi^2(2, N=576) = 1.736 p=.42$

† $\chi^2(2, N=576) = 19.55 p<.0005$

‡ $\chi^2(2, N=576) = 7.350 p = .020$

Although the most frequently identified reasons for not performing FBAO skills were the fear of performing it incorrectly and the fear of legal liability, participants certified multiple times were more likely to report that they would perform FBAO skills in an emergency situation. This suggests that increased time allocated to critically reviewed mannequin practice could bolster teachers' willingness to perform FBAO skills and possibly CPR. Since increased exposure to training is associated with a greater willingness to perform real-world actions, this finding underscores the importance of requiring ongoing training and certification.

Additionally, many participants perceived that there was too much confusing information in their CPR training and insufficient training time, suggesting that a curriculum designed to ensure adequate time and clarity of presentation is important. Given the number of participants who did not perceive CPR as an important skill for teachers, providing emphasis on the legal responsibilities and protection of teachers to administer CPR/FBAO procedures might also help influence the willingness to perform these procedures. Finally, the presentation of scenarios illustrating when CPR/FBAO procedures are required through case studies may be helpful. Such an approach might help prepare future teachers by allowing them to self-assess their own expectations and attitudes.

Limitations

The main limitation of this study concerns the use of study population from a limited geographical area in the United States. Given the sample selection, results cannot automatically be generalized to all teacher-trainee populations. Given that the study was designed to assess teachers' general willingness to perform CPR, this study did not directly assess how CPR training directly affects willingness to perform CPR. Future research to assess outcomes associated with specific CPR training should utilize a study design in which willingness is assessed before and after the course and a comparison with a control group.

The survey instrument used in this study queried anticipated behaviors, but candidates' actual behaviors with real victims on the job may differ. California's Good Samaritan law protects lay rescuers providing emergency medical aid from legal liability. However, recent civil litigation in which "Good Samaritans" have been found liable for injuries occurring during a rescue



(Alexandra Van Horn vs. Anthony Glen Watson et al., 2009) could significantly alter willingness to perform CPR or render any assistance in an emergency. If the potential legal liability to which potential rescuers are exposed should change significantly, given proposed legislation in California designed to extend Good Samaritan protections (Adams, 2009; Benoit, 2009; Feuer, 2009), the rescuers' willingness to perform CPR/FBAO skills might change from the levels reported in this study.

Additionally, recent changes in CPR curricula, which have tended to simplify emergency procedures (e.g., less emphasis on mouth-to-mouth breathing), might increase willingness to perform CPR/FBAO skills, particularly among participants who reported a fear of performing the procedures incorrectly or a fear of infectious disease transmission. Further, the varying amount of time between CPR course completion and survey administration might have influenced participants' reported willingness to perform CPR and thereby affected the study findings.

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