Comparison of a Low and High Resource Model to Effectively Train College Students in Compression Only Cardiopulmonary Resuscitation

Matthias Goldstein, Benjamin Goldstein, Joel Novograd, Kailah Carden, Towson Univ, Baltimore County, MD; Michelle Kirwan, Univ of Maryland Sch of Nursing, Baltimore City, MD

Student Health Services/ Health Center, Towson University, Towson MD, USA

Introduction

High quality chest compressions, as measured by depth and rate per minute, are an integral component of cardiopulmonary resuscitation (CPR). CPR compression skills are often taught on a high resource training device such as a manikin torso. Use of these manikin torso devices may be limited by availability and cost, reducing the number of individuals trained in CPR. We hypothesize that a bed pillow, a low resource device, is as effective as a manikin torso, a high resource device, in training college students to perform compression only CPR.

Objectives

The objective of this study is to answer the question: Can a low resource technique, such as a pillow, be used to effectively train people in hands only cardiopulmonary resuscitation (CPR)?

Assumptions:

- Proliferation of CPR training is important
- Frequent practice is important
- Access to manikins for practice is generally limited due to availability and financial constraints

Benefits of a low resource training technique:

- Allows for training to more individuals due to greater access to "equipment"
- Allows training to more individuals due to lower costs
- Promotes more frequent psychomotor skill practice due to availability (practice tool is a common household item)

Methods

College students with no prior CPR training were randomized to one of two training rooms, one with a bed pillow (n=119) and one with a manikin torso (n=123). Each participant watched a two-minute training video, which included a demonstration using the respective device and a practice-while-watching technique chest compression skills practice. Each room had a certified CPR instructor to assist and answer any technical questions. Another CPR instructor, blinded to the training randomizations, observed each participant for one minute on a recording manikin that evaluated the depth and rate of compressions.

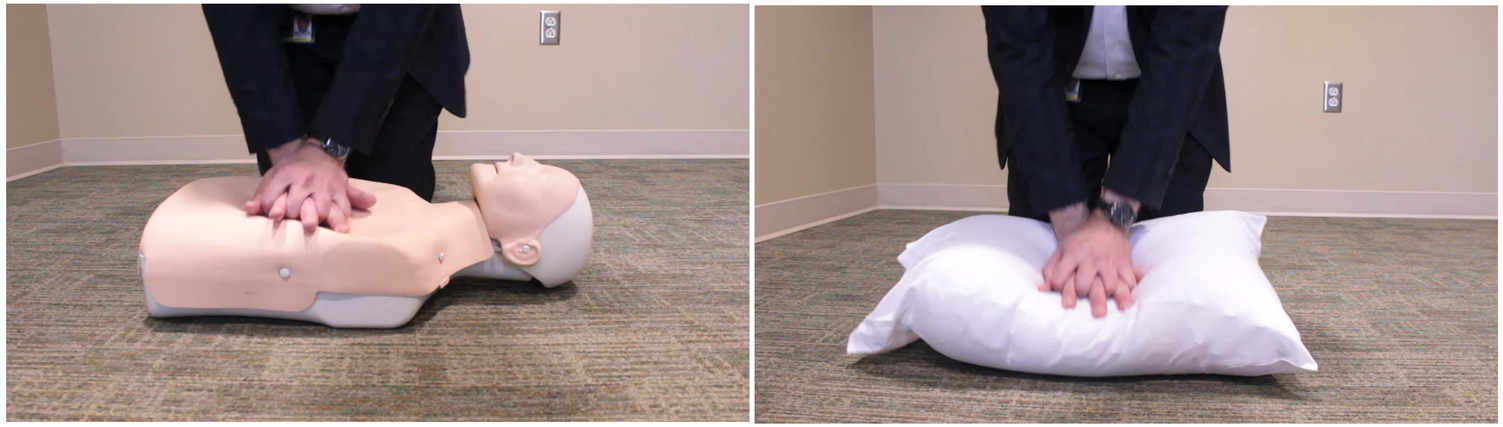

Figure 1 – Pictures taken from training videos with demonstration on a manikin vs. a pillow After watching the video demonstrations, study subjects practiced along with the video utilizing the Practice-While-Watching technique.

Results

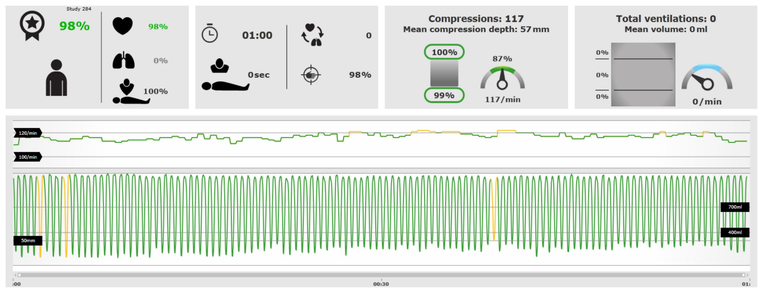

Figure 2 – Example of data collected from recording manikin used to test both study groups A Laerdal Resusci Anne® QCPR manikin was used to record the compression rate and depth of all study subjects.

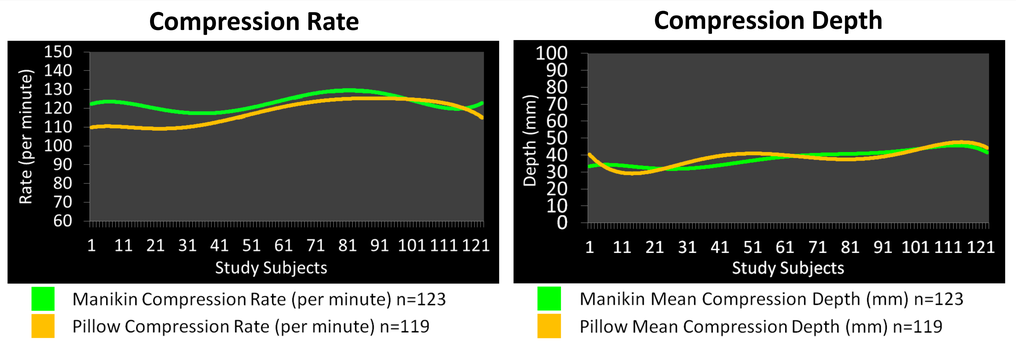

Figure 3 – Trend line showing comparable results of pillow vs manikin compression rate and depth

Manikin-trained students had a significantly higher mean rate of compressions per minute compared to the pillow-trained students (122.9 vs. 118.0; p= 0.028). The manikin group exceeded the recommended rate range (100-120 compressions per minute). There was no significant difference between compression depth in the two groups; manikin-trained students had an average compression depth of 38.27 mm while pillow-trained students had an average compression depth of 38.50 mm (p=0.89). Mean compression depth for both groups was below the guidelines (50-61 mm).There was no significant difference (p=0.81) between the overall CPR competency of the pillow-trained compared to the manikin-trained students as measured by rate and depth of compressions.

Conclusion

These findings demonstrate that a low resource pillow is comparable to a high resource manikin as a CPR training device. The use of a low resource training device can remove the barriers of cost and availability in training college students in CPR. This training method will allow for an increase in the number of people trained to save lives.

Reference

Hazinski MF, Nolan JP, Aickin R, Bhanji F, Billi JE, Callaway CW, Castren M, de Caen AR, Ferrer JME, Finn JC, Gent LM, Griffin RE, Iverson S, Lang E, Lim SH, Maconochie IK, Montgomery WH, Morley PT, Nadkarni VM, Neumar RW, Nikolaou NI, Perkins GD, Perlman JM, Singletary EM, Soar J, Travers AH, Welsford M, Wyllie J, Zideman DA. Part 1: executive summary: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. Circulation.2015;132(suppl 1):S2–S39.