Teaching Cardiopulmonary Resuscitation to Young Children (<12 Years Old)

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Out-of-hospital cardiac arrest is a major public health concern. Research has shown that initiation of cardiopulmonary resuscitation (CPR) by lay bystanders increases survival rates. Evidence also shows that CPR training, delivered in various ways, is successful in a wide age range of children. This study was conducted to assess if children (average age of 12) were able to perform high quality chest compressions and whether this can be achieved by supplementing CPR instructional video with other methods to time delivery of compressions. A total of 160 study subjects were divided into 3 groups. The CPR instructional video was played for all 3 groups. One group (n = 53) was instructed to time their compressions with a popular music. Another group (n = 56) was assigned to a specially designed video game whereby they practiced how to time chest compressions. The control group (n = 51) consisted of those who only watched the video. Each group was divided in teams of 3 and observed for successful delivery of chest compressions on the little Anne Adult CPR training manikins. The control group performed a mean of 88 compressions per minute (CPM) out of which a mean of 72 clicks were appreciated. The music group performed 104 CPM with 74 clicks. Meanwhile, the video game group performed 102 CPM with 78 clicks. This study demonstrated sixth graders are capable of learning and performing effective hands only bystander CPR and this can and should be taught in schools even as young as the sixth grade level. **(Am J Cardiol 2019;123:1626−1627)**

The outcome after compression only cardiopulmonary resuscitation (CPR) alone is similar to that after chest compression with mouth-to-mouth ventilation.[1,2] Bystander CPR was associated with a significantly lower risk of brain damage or nursing home admission than that associated with no bystander resuscitation.[3] However in most countries lay CPR rate is <30%. If this rate is increased to 60% to 80%, it translates into additional 200,000 to 300,000 survivors after out of hospital cardiac arrest. Several countries have demonstrated by providing CPR training to school children as young as under 12 years of age has a significant impact on survival rates of out of hospital cardiac arrest.[4] Training school children are easy, cost effective, and currently it is a worldwide initiative. Repeated training improves performance and retention but the format and frequency of repeated training is yet to be fully determined.[5]

Methods

This study tried to assess the following: (1) If children in sixth grade level (average age of 12) were able to perform high quality chest compression, (2) to determine whether high quality chest compressions can be achieved by supplementing CPR instructional video with other methods to time chest compression delivery. There were a total of 160 study subjects. They were divided into 3 groups. The video was played for all 3 groups. One group (53 children) was instructed to imitate chest compressions timed with a popular music used to time compression delivery. Another group (56 children) was assigned to a specially designed video game whereby they learn how to time chest compressions. The control group (51 children) consisted of those who only saw the video. Each group was then divided in teams of 3 and observed for successful delivery of chest compressions on the little Anne adult CPR training manikins.

Results

Table 1 lists the average number of CPMs and clicks on the manikin in each of the 3 groups. In addition, we assessed whether compressions were delivered in the correct location and the children remembered to call 911 before initiating CPR.

Discussion

Most children included in our study remembered to call 911 and performed CPR in correct location. Most produced high quality chest compressions with clicks over 70% of their compressions. The music group and the video game group both attained goal compression rate for effective CPR, whereas the control group was lower. Tempo-reinforcing tools like music and video games may help children attain goal compression rate. We confirmed that sixth graders are capable of learning and performing effective hands only bystander CPR and this can and should be taught in schools

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Project performed at John F Kennedy Elementary School Riverside Unified School District. Video game used in the study designed by Eashan S. Biswas

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Table 1
Results of the study. Data obtained from the control, music, and video game groups

	Children who called 911 (%)	Correct location of chest compression (%)	Compressions per minute performed	Clicks appreciated per minute
Control group (N = 51)	98	98	88 (SEM 4.2)	72
Music group (N = 53)	93	85	104 (SEM 4.0)	74
Video game group (N = 56)	87	95	102 (SEM 4.5)	78

even as young as the sixth grade level. School children can also play an important role as multipliers by teaching adults in the family and their communities. This way CPR rates can be increased successfully and rapidly throughout a country.[4] We recommend legislative and funded mandates to provide such training to schoolchildren, and production and use of a framework which will delineate longitudinal delivery of training over the school career.

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