ORIGINAL RESEARCH

DOI: 10.14744/globecc.2026.30932
Glob Emerg Crit Care 2026;5(3):117-124

The Effectiveness of the İzmir March Rhythm Compared to the International Musical Metronome ("Stayin' Alive") in Cardiopulmonary Resuscitation (CPR) Training for Military Personnel: A Randomized Controlled Crossover Pilot Study

Mehmet Tatlı[1], Mevlüt Özgür Acar[2], Ahmet Aykut[1], Ertuğ Günsoy[1], Mehmet Necmeddin Sutaşır[3]

[1]*University of Health Sciences, Van Training and Research Hospital, Department of Emergency Medicine, Van, Türkiye*
[2]*Van Provincial Health Directorate, Provincial Ambulance Service Directorate, Van, Türkiye*
[3]*University of Health Sciences, Basaksehir Cam and Sakura City Hospital, Department of Emergency Medicine, İstanbul, Türkiye*

Abstract

Objective: Maintaining the correct chest compression rate is a critical challenge in cardiopulmonary resuscitation (CPR). Although musical metronomes such as "Stayin' Alive" are widely used, their effectiveness may vary across cultural contexts. This pilot study evaluated whether a culturally relevant Turkish military march, The İzmir March, could serve as an alternative pacing aid for compression-only CPR training in military personnel and described within-cohort retention of the compression rate at 6 weeks.

Materials and Methods: We conducted a randomized controlled crossover pilot study involving 20 male military personnel without prior healthcare training. Participants were randomized to receive initial training paced by either the Izmir March (Group M, n=10) or "Stayin' Alive" (Group S, n=10). CPR performance was recorded using a QCPR manikin at baseline, during music-paced sessions (trained and untrained after a 1-day washout crossover), and at a 6-week music-free follow-up. Paired t-tests and Wilcoxon signed-rank tests with Bonferroni correction were performed.

Results: At 6 weeks, 70% of participants (14/20) maintained a compression rate within the target range of 100–120/min. The Izmir March group achieved a higher mean compression rate than the Stayin' Alive group (114.8±5.3 vs. 105.5±6.1 compressions/min; $p<0.001$). However, the Stayin' Alive group achieved a higher proportion of compressions within the optimal 100–120/min range (adequate rate: 86.3% vs. 79.3%). No carryover effects were observed between conditions.

Conclusion: In this military cohort, within-cohort compression rates moved closer to the recommended target range of 100–120/min at 6 weeks compared with baseline. The Izmir March (115 BPM) yielded a higher mean compression rate than "Stayin' Alive" (103 BPM), although this between-song difference is heavily confounded by beat frequency. The findings should be interpreted as differences between two music-based pacing strategies rather than as evidence that music-assisted training improves retention compared with standard training. Further trials with non-music controls are needed to evaluate the Izmir March as a culturally familiar pacing aid.

Keywords: Cardiopulmonary resuscitation; compression rate; crossover design; military personnel; music; skill retention.

Introduction

Sudden cardiac arrest remains a major cause of mortality worldwide, and survival is critically dependent on the immediate delivery of high-quality cardiopulmonary resuscitation (CPR). A cornerstone of effective CPR is maintaining chest compressions at a rate of 100–120 per minute and at an adequate depth [1]. However, rescuers, particularly novices, often find it difficult to sustain this target rate, leading to a gradual deviation from the target over time, a phenomenon known as "rate drift" [3].

Address for Correspondence: Mehmet Tatlı, University of Health Sciences, Van Training and Research Hospital, Department of Emergency Medicine, Van, Türkiye
E-mail: drmehmettatli@gmail.com **ORCID-ID:** 0000-0001-5907-9161

Received: 10.02.2026 **Revised Date:** 22.05.2026 **Accepted:** 25.05.2026

Cite this article as: Tatlı M, Acar MÖ, Aykut A, Günsoy E, Sutaşır MN. The effectiveness of the Izmir March rhythm compared to the international musical metronome ("Stayin' Alive") in Cardiopulmonary Resuscitation (CPR) training for military personnel: a randomized controlled crossover pilot study. Glob Emerg Crit Care 2026;5(3):117-124.

To mitigate this challenge, auditory metronomes and feedback devices have been integrated into CPR training [4]. The Bee Gees' song "Stayin' Alive," with a tempo of approximately 103 beats per minute (BPM), has gained international recognition as a musical metronome for CPR, and its utility has been documented in simulation studies [2,5]. Several studies suggest that music-assisted training can enhance CPR pacing and skill retention compared with no-music or metronome-only conditions [6–8].

This study focused on CPR training and skill retention in a military context. Military personnel are uniquely conditioned to synchronize their movements with rhythmic marches during training and official duties, which may enhance their performance in physically demanding tasks [9]. Furthermore, cultural and native-language familiarity with music has been associated with stronger motor synchronization compared with unfamiliar music in a randomized crossover trial of culture-specific popular songs for CPR pacing [10]. The Izmir March, a well-known and integral part of the Turkish military tradition, was identified as a candidate that could leverage this principle. Its national and military significance may enhance soldiers' motivation and rhythmic synchronization.

Although culture-specific popular music has been examined as a CPR pacing aid in civilian populations [10], its application in military personnel using a national military march has not, to our knowledge, been previously studied. This pilot study evaluated the Izmir March, a Turkish military anthem, as a musical metronome during compression-only CPR training in military personnel. The primary aim was to assess within-cohort retention of the compression rate within the 100–120/min target range at 6 weeks. The secondary aim was to compare CPR quality metrics between the Izmir March and "Stayin' Alive" on Day 0. We acknowledge a priori that the Izmir March (approximately 115 BPM) and "Stayin' Alive" (approximately 103 BPM) differ in beat frequency and that observed differences in compression rate will partly reflect this tempo difference rather than cultural or motivational factors alone.

Our primary hypothesis was that, within this military cohort, post-training compression rates at 6 weeks would lie within the target range in at least 70% of participants. Our secondary hypothesis was that the Izmir March would not be inferior to "Stayin' Alive" in achieving compression rates within the 100–120/min target range. Because no non-music control group was included, the present study cannot establish that music-assisted training is superior to standard CPR training without music; it can only compare two music-based pacing strategies and describe post-training retention within this cohort.

Materials and Methods

Study Design and Participants

This was a randomized, controlled, single-center, crossover pilot study. The study population consisted of 20 male volunteer military personnel aged 18–45 years who had not received CPR training within the previous 5 years and had no physical limitations that would impede their ability to perform CPR. Individuals with prior healthcare training were excluded. Of 22 individuals assessed for eligibility, 2 were excluded prior to randomization (1 declined participation; 1 did not meet the inclusion criteria), leaving 20 participants for randomization. The study protocol was approved by the Van Training and Research Hospital Ethics Committee (Decision No. GOKAEK/2025-08-04; Date: 24.10.2025), and all participants provided written informed consent prior to enrollment. The flow of participants through the study is shown in Figure 1.

Randomization and Allocation

Sequentially numbered participants were allocated 1:1 to Group M (Izmir March, n=10) or Group S ("Stayin' Alive," n=10) using a web-based random number generator (Research Randomizer; https://www.randomizer.org/) operated by the principal investigator. Formal allocation concealment using sealed, opaque envelopes prepared by an independent third party was not implemented; this is acknowledged as a limitation. Given the nature of the intervention, blinding of participants was not feasible; however, all CPR performance data were captured automatically by the QCPR software, eliminating subjectivity from the primary outcome measurement. All participants first received standardized compression-only CPR instruction consistent with the 2025 AHA Guidelines for CPR and ECC [1], after which each group practiced using their assigned music.

Music Selection

The military march selected for this study was based on CPR suitability criteria, including a steady tempo (minimal tempo variation), clear beats, and a tempo within the AHA-recommended range of 100–120 beats/min (BPM). Various marches that met these criteria, such as the Harbiye March (118 BPM), Ceddin Deden (108–112 BPM), and the Izmir March (115–120 BPM), were evaluated, and a 115 BPM version of the Izmir March was selected for the study.

The specific Izmir March recording used in this study was a vocal version with original Turkish lyrics, with the tempo confirmed at 115 BPM (source recording publicly available at https://www.youtube.com/watch?v=khabhCrXHvU). For "Stayin' Alive," the original 1977 Bee Gees vocal recording (approximately 103 BPM)

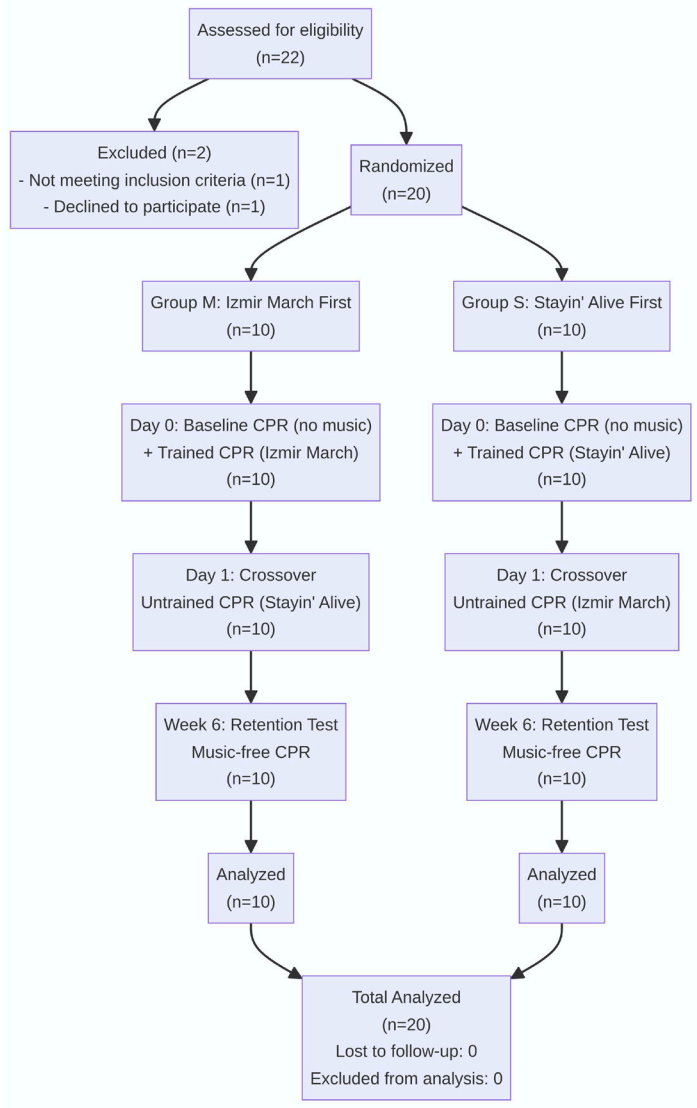

Figure 1. CONSORT flow diagram of the study. Group M: Izmir March group; Group S: Stayin' Alive group.

was used. A 2-minute clip from each recording was prepared and used uniformly across all training and testing sessions. The exact audio clips used in this study are archived and available from the corresponding author upon reasonable request.

CPR Format and Test Environment

All CPR sessions were performed as continuous compression-only CPR, without rescue breaths, in accordance with compression-only protocols suitable for non-healthcare lay rescuers. The Laerdal Little Anne QCPR manikin was placed on a flat, firm floor surface in a quiet training room. Music was delivered via a standard stereo speaker at a fixed volume (approximately 70 dB at the participant's position) rather than through personal headphones, replicating realistic group training conditions. Participants were instructed to begin chest compressions synchronously with the first audible beat of the assigned music clip and to maintain the music's rhythm throughout the 2-minute session. The same operator timed all sessions and ensured uniform clip onset.

Measurement Protocol

The data collection process was conducted in three stages:

Day 0 (Training and Initial Measurement): Participants first performed 2 min of compression-only CPR without music (baseline). Following this, they performed 2 min of CPR under the "trained" condition with their assigned music.

Day 1 (Crossover): After a 1-day washout period, participants performed 2 min of CPR under the "untrained" condition using the alternate music selection. A 1-day washout was deemed sufficient to minimize potential carryover effects from the previous day's music, consistent with similar crossover studies [10].

Week 6 (Skill Retention): To assess skill retention, participants performed 2 min of compression-only CPR without musical guidance 6 weeks after the initial training.

All CPR performance data were recorded using a Laerdal Little Anne QCPR manikin (Little Anne Mk1 platform) and the associated Laerdal QCPR application (Laerdal Medical, Stavanger, Norway). The manikin was calibrated to the standard AHA settings, with a target compression depth of 50–60 mm. Before and after each CPR session, participants' pulse and peripheral oxygen saturation (SpO_2) were measured. After each session, perceived exertion was assessed using the Borg Rating of Perceived Exertion (RPE) scale (6–20), and muscle fatigue was rated using a visual analog scale (VAS) (0–10). Additionally, satisfaction with the training, perceived ease of maintaining the compression rate, and overall confidence in performing CPR were evaluated using a 5-point Likert scale.

Endpoints

Primary Endpoint: The primary endpoint was the successful maintenance of a mean compression rate within the 100–120/min target range during the music-free CPR assessment at 6 weeks post-training. Success was defined a priori as at least 70% of participants achieving the target, representing a pragmatic feasibility benchmark in which the majority of trainees retained target-range performance after a single training session. Higher thresholds (e.g., 80–90%) would likely require booster or repeated training sessions, which were beyond the scope of this pilot study.

Secondary endpoints included comparisons of CPR quality metrics (e.g., rate, depth, and overall score) between the Izmir March and "Stayin' Alive" conditions on Day 0, performance differences

between the trained and untrained conditions, and changes in subjective scores (Borg RPE and VAS) and physiological measures (pulse and SpO_2) across all conditions.

Sample Size Rationale

As an external pilot feasibility study, this trial was not powered for definitive between-group inference. The sample size of n=20 (10 per group) follows established pilot study recommendations. These recommendations suggest that 10–15 participants per arm are adequate for estimating key parameters, such as standard deviations, recruitment feasibility, and retention rates, to inform a future definitive trial powered for a small-to-medium standardized effect [11,12]. The chosen sample size was also constrained by the availability of an eligible military cohort and the practical feasibility of completing the 6-week retention assessment within a single training cycle. Reporting follows the CONSORT 2010 extension for randomized pilot and feasibility trials [16].

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics software (version 26.0; IBM Corp., Armonk, NY, USA). The Shapiro–Wilk test was used to assess the normality of data distributions. For normally distributed data, paired-samples t-tests were used, whereas the nonparametric equivalent, the Wilcoxon signed-rank test, was applied to non-normally distributed data. To control for Type I errors arising from multiple comparisons, a Bonferroni correction was applied across the eight primary comparisons, setting the threshold for statistical significance at $p<0.0063$. Effect sizes were calculated using Cohen's d. Ninety-five percent confidence intervals (CIs) are reported for primary outcome comparisons.

Results

All 20 participants enrolled in the study completed every stage of the study (Fig. 1). The demographic characteristics and baseline CPR performance were comparable between the two groups, with no statistically significant differences observed in age, anthropometric measurements, or initial CPR metrics ($p>0.05$ for all; Tables 1 and 2).

Primary Endpoint: Skill Retention

During the music-free evaluation at 6 weeks, 70% (14/20) of participants successfully maintained a compression rate within the 100–120/min target range. The mean compression rate at 6 weeks (111.0±9.5 comp/min) was significantly lower than the baseline rate (121.6±14.1 comp/min), moving closer to the recommended range (mean difference: 10.7 comp/min; 95% CI [4.0, 17.3]; $p=0.003$; Cohen's $d=0.89$). The proportion of compressions delivered within the target range also increased from 43.5% at baseline to 66.8% at 6 weeks, although this change did not reach statistical significance after Bonferroni correction ($p=0.015$). The results are presented in Table 5.

Secondary Endpoints

Comparison of Music Types: On Day 0, the mean compression rate achieved with the Izmir March (114.8±5.3 comp/min) was significantly higher than that achieved with "Stayin' Alive" (105.5±6.1 comp/min), with a mean difference of 9.3 comp/min (95% CI [6.1, 12.5]; $p<0.001$; Cohen's $d=1.63$). No significant difference in compression depth was observed between the two types of music ($p>0.05$). Although the Izmir March produced a higher mean compression rate that remained within the target range, the "Stayin' Alive" group achieved a higher proportion of compressions within the optimal 100–120/min range (adequate rate: 86.3% vs. 79.3%; $p<0.001$; Cohen's $d=0.25$), as well as nonsignificantly higher percentages of correct chest release and overall quality scores. This pattern suggests that lower-tempo music may provide a wider "safety margin" against rate drift toward the upper limit, whereas higher-tempo music produces faster but more variable rates. The findings are presented in Table 4.

Crossover and Subjective Effects: No significant carryover effect was detected, as CPR performance metrics did not differ between the trained and untrained music conditions ($p>0.05$; Table 3). Participants' subjective ratings of exertion (Borg RPE) and

Table 1. Demographic characteristics of participants

Characteristic	Group M (n=10)	Group S (n=10)	Total (n=20)	p
Age (years), mean±SD	21.5±1.5	21.2±1.3	21.4±1.4	0.62
Height (cm), mean±SD	175.4±5.2	176.1±4.8	175.8±4.9	0.75
Weight (kg), mean±SD	72.1±8.5	73.5±7.9	72.8±8.1	0.68
Arm Circumference (cm), mean±SD	30.5±2.1	30.8±2.3	30.7±2.2	0.79
Regular Exercise, n (%)	5 (50%)	4 (40%)	9 (45%)	0.69
Smoking, n (%)	6 (60%)	5 (50%)	11 (55%)	0.69

Group M: Izmir March group; Group S: Stayin' Alive group; SD: Standard deviation

Table 2. Baseline CPR performance

Metric	Group M (n=10)	Group S (n=10)	Total (n=20)	p
Compression Rate (comp/min) mean±SD	122.1±15.2	121.1±13.5	121.6±14.1	0.85
Adequate Rate (%) mean±SD	45.2±35.1	41.8±38.2	43.5±36.0	0.84
Compression Depth (mm) mean±SD	75.1±6.2	76.5±5.8	75.8±5.9	0.59
Correct Release (%) mean±SD	75.2±30.1	72.8±32.5	74.0±30.8	0.86
Total Score	65.2±10.1	66.8±9.5	66.0±9.7	0.68

CPR: Cardiopulmonary Resuscitation; comp/min: Compressions per minute; SD: Standard deviation

Table 3. Crossover effect (trained vs. untrained)

Metric	Trained (n=20)	Untrained (n=20)	p
Compression Rate (comp/min) mean±SD	109.3±8.3	111.0±5.9	0.52
Compression Depth (mm) mean±SD	77.5±5.1	77.3±5.3	0.89
Total Score	70.5±8.1	70.0±8.5	0.78

Trained: CPR performed with the music type the participant was initially trained with; Untrained: CPR performed with the other music type

fatigue (VAS) were also similar across all conditions (Table 6), as were physiological responses (Table 7). Participants reported high levels of satisfaction with the training and confidence in their ability to perform CPR, with no significant differences between the music groups (Table 8).

Table 4. Comparison of music types (Day 0)

Metric	Izmir March (n=10)	Stayin' Alive (n=10)	p
Compression Rate (comp/min) mean±SD	114.8±5.3	105.5±6.1	<0.001*
Compression Depth (mm) mean±SD	77.0±5.5	77.8±4.8	0.68
Adequate Rate (%) mean±SD	79.3±31.1	86.3±24.9	<0.001*
Correct Release (%) mean±SD	68.0±41.1	89.2±24.7	0.15
Total Score	68.7±9.5	71.8±7.6	0.23

*Statistically significant after Bonferroni correction (p<0.0063). Effect sizes: Compression Rate (Izmir March vs. Stayin' Alive), Cohen's d=1.63, mean difference 9.3 comp/min, 95% CI [6.1, 12.5]; Adequate Rate, Cohen's d=0.25. comp/min: Compressions per minute; SD: Standard deviation; CI: Confidence interval

Table 5. Skill retention (6-week follow-up)

Metric	Baseline (n=20)	6-Week (n=20)	p
Compression Rate (comp/min) mean±SD	121.6±14.1	111.0±9.5	0.003*
Adequate Rate (%) mean±SD	43.5±36.0	66.8±35.1	0.015
Compression Depth (mm) mean±SD	75.8±5.9	76.5±5.5	0.59
Total Score	66.0±9.7	68.5±8.9	0.18

*Statistically significant after Bonferroni correction (p<0.0063). Effect size for the primary outcome (Compression Rate, baseline vs. 6-week): Cohen's d=0.89, mean difference 10.7 comp/min, 95% CI [4.0, 17.3]. comp/min: compressions per minute; SD: Standard deviation; CI: Confidence interval

Table 6. Subjective measurements (VAS and Borg RPE)

Measurement	Baseline	March	Stayin' Alive	6-Week
VAS (0–10), mean±SD	6.7±0.7	5.8±0.8	6.5±0.5	6.5±0.6
Borg RPE (6–20), mean±SD	11.7±1.3	10.9±0.8	11.2±1.0	11.3±1.0

VAS: Visual Analogue Scale; RPE: Rating of Perceived Exertion; SD: Standard Deviation

Table 7. Physiological responses (pulse and saturation)

Measurement	Baseline	March	Stayin' Alive	6-Week
Pulse Change (bpm), mean±SD	38.5±9.5	37.0±10.1	40.0±7.8	38.2±9.1
SpO_2 Change (%), mean±SD	-0.5±0.8	-0.4±0.7	-0.6±0.9	-0.5±0.8

bpm: Beats per minute; SpO_2: Peripheral oxygen saturation; SD: Standard deviation

Table 8. Training satisfaction and self-confidence

Measurement	Mean±SD	5-Point (%)	4-Point (%)
Training Satisfaction	4.75±0.43	75%	25%
Ease of Rate Maintenance	4.80±0.40	80%	20%
Overall CPR Confidence	4.85±0.36	85%	15%

Likert scale (1–5): 1=Not at all satisfied/Very difficult/Not at all confident, 5=Very satisfied/Very easy/Very confident

Discussion

This randomized controlled crossover pilot study describes post-training compression-rate retention in a military cohort and compares two music-based pacing strategies. Participants paced with the Izmir March (115 BPM) achieved higher mean compression rates than those paced with "Stayin' Alive" (103 BPM). Because we did not include a non-music control group, we cannot conclude whether music-assisted training outperforms standard training. We therefore report these findings as a comparison of two pacing strategies rather than as evidence of a music-versus-no-music effect on retention.

In this cohort, both music conditions maintained mean compression rates within the AHA-recommended target range of 100–120/min. The Izmir March, a culturally significant Turkish military anthem, produced rates closer to the upper end of this range, whereas "Stayin' Alive" produced rates closer to the lower end. The faster compression rate observed with the Izmir March (114.8 comp/min) is largely explained by its inherent tempo (115 BPM). However, subjective effort ratings (VAS) were slightly lower with the Izmir March despite its faster tempo, suggesting a possible additional contribution from cultural or motivational factors that the present design cannot disentangle from beat frequency. These mechanisms are discussed below.

Tempo Confound and Mechanism Disambiguation

The most important threat to internal validity in this study is that the two musical pieces inherently differ in beat frequency (Izmir March ~115 BPM vs. "Stayin' Alive" ~103 BPM). A substantial portion of the observed between-song difference in compression rate likely reflects this tempo difference rather than cultural familiarity or motivational arousal alone. The current design cannot disentangle three plausible mechanisms:

(1) Beat-frequency entrainment, in which participants synchronize compressions with the audible beat regardless of music identity;

(2) Cultural familiarity and native-language semantic activation, whereby the Izmir March is a familiar Turkish anthem with culturally meaningful lyrics that may enhance rhythmic adherence through long-term sensorimotor associations [9,10];

(3) Motivational arousal and military identity, as the Izmir March, a national military anthem, may evoke heightened arousal, collective identity, and motivation distinct from generic cultural familiarity [9,15].

Although beat frequency is the dominant explanation for the differences in compression rate, two observations are consistent with an additional contribution from familiarity and/or arousal. First, subjective ratings of effort (VAS) were modestly lower for the Izmir March (5.8±0.8) than for "Stayin' Alive" (6.5±0.5; Table 6), despite the faster tempo of the former, which would ordinarily be expected to increase perceived exertion. Second, participants performed compressions within their native cultural and military context, in which the Izmir March holds symbolic significance not present for "Stayin' Alive." These observations are exploratory; future trials should disentangle these mechanisms using factorial designs (e.g., culturally familiar vs. unfamiliar music at matched BPM; instrumental vs. vocal versions of the same piece; tempo-matched military marches from a different cultural context).

Trade-off Between Rate and Quality

An important nuance is the potential trade-off between rate and quality. Although the Izmir March yielded a higher mean rate, the "Stayin' Alive" condition produced a higher adequate-rate proportion (within-target compressions) and slightly higher correct-release and total-score metrics, although the latter two did not reach statistical significance. This pattern is consistent with the hypothesis that tempos closer to the lower end of the target range may allow a wider tolerance for rate drift and better preservation of compression quality [13]. Future research should explore whether an optimal tempo near 105–110 BPM balances rate accuracy and quality and whether supplemental training (e.g., real-time feedback devices [14]) can mitigate quality decrements at higher tempos.

Study Limitations

This study had several limitations. As a pilot study, the sample size (n=20) was small and intended for preliminary parameter estimation [11,12], which limits the generalizability of our findings to other populations and may not have been sufficient to detect smaller effect sizes. Consequently, a formal power analysis was not performed. The homogeneous nature of the participant group (young male soldiers), the unblinded design, and the use of manikin-based measurements [17] further

indicate that these results should be interpreted as foundational rather than definitive.

Additionally, the two musical pieces differ in beat frequency, which is the most likely dominant explanation for the differences in compression rate and limits causal attribution to cultural or motivational mechanisms. Allocation concealment using sealed, opaque envelopes was not implemented; randomization was performed by the principal investigator using a web-based generator, which may have introduced selection bias, although baseline characteristics were comparable across groups (Tables 1 and 2). Musical preference, prior exposure, and emotional attachment to the Izmir March were not measured before randomization and may represent unmeasured confounders.

Notably, the study did not include a non-music control group; therefore, we cannot conclude that music-assisted training improves long-term retention compared with standard CPR training alone. The retention observed at 6 weeks is reported as a within-cohort exploratory observation rather than as a comparative claim against a non-music condition. However, these findings provide a foundation for larger, adequately controlled trials.

Conclusion

In this pilot study, compression-only CPR paced by the Izmir March (115 BPM) produced higher mean compression rates than pacing with "Stayin' Alive" (103 BPM), although this between-song difference is largely attributable to differences in beat frequency. Within the cohort, post-training compression rates moved closer to the 100–120/min target range at 6 weeks. Both music conditions maintained mean compression rates within the target range; "Stayin' Alive" resulted in a higher proportion of within-target compressions, whereas the Izmir March produced a higher absolute mean rate. Further studies should evaluate the Izmir March in larger trials with non-music control groups and designs that distinguish the effects of beat frequency, cultural familiarity, and motivational arousal.

Acknowledgments: The authors would like to thank the military personnel who voluntarily participated in this study for their valuable contribution.

Ethics Committee Approval: This study was approved by the Van Training and Research Hospital Ethics Committee (Decision No: GO-KAEK/2025-08-04, Date: 24.10.2025).

Informed Consent: Written informed consent was obtained from all participants included in this study.

Conflict of Interest: The authors declare that there is no conflict of interest.

Use of AI for Writing Assistance: The authors declared that artificial intelligence was not used in the study.

Financial Disclosure: The authors declared that this study received no financial support.

Authorship Contributions: Conception: M.T., M.Ö.A., Design: M.T., E.G., Supervision: A.A., Materials: M.T., M.N.S., Data Collection and/or Processing: M.T., M.N.S., M.Ö.A., Analysis and/or Interpretation: M.T., A.A., Literature Search: M.T., E.G., A.A., Writing: M.T., Critical Reviews: A.A., M.N.S.

Peer-review: Externally peer-reviewed.

References

1. Kleinman ME, Buick JE, Huber N, Idris AH, Levy M, Morgan SG, et al. Part 7: Adult Basic Life Support: 2025 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation. 2025;152(16_suppl_2):S448-S78.
2. Hafner JW, Sturgell JL, Matlock DL, Bockewitz EG, Barker LT. Stayin' alive: a novel mental metronome to maintain compression rates in simulated cardiac arrests. J Emerg Med. 2012;43:e373-e7.
3. Sutton RM, Niles D, Nysaether J, Abella BS, Arbogast KB, Nishisaki A, et al. Quantitative analysis of CPR quality during in-hospital resuscitation of older children and adolescents. Pediatrics. 2009;124:494-9.
4. Kennedy J, Machado K, Maynard C, Walker RG, Sayre MR, Counts CR. Metronome use improves achievement of a target compression rate in out-of-hospital cardiac arrest: A retrospective analysis. Resusc Plus. 2023;15:100417.
5. Hafner JW, Jou AC, Wang H, Bleess BB, Tham SK. Death before disco: the effectiveness of a musical metronome in layperson cardiopulmonary resuscitation training. J Emerg Med. 2015;48:43-52.
6. Tastan S, Ayhan H, Unver V, Cinar FI, Kose G, Basak T, et al. The effects of music on the cardiac resuscitation education of nursing students. Int Emerg Nurs. 2017;31:30-5.
7. Pellegrino JL, Vance J, Asselin N. The value of songs for teaching and learning cardiopulmonary resuscitation (CPR) competencies: a systematic review. Cureus. 2021;13:e15053.
8. Riggs M, Franklin R, Saylany L. Cardiopulmonary resuscitation (CPR) psychomotor skills of laypeople, as affected by training interventions, number of times trained and retention testing intervals: A dataset derived from a systematic review. Data Brief. 2019;25:104236.
9. Karageorghis CI, Priest DL. Music in the exercise domain: a review and synthesis (Part I). Int Rev Sport Exerc Psychol. 2012;5:44-66.
10. Ho AFW, Liu Z, Wah W, Fook-Chong S, Pek PP, Lo HY, et al. Evaluation of culture-specific popular music as a mental metronome for cardiopulmonary resuscitation: a randomised crossover trial. Proceedings of Singapore Healthcare. 2019;28:159-66.
11. Whitehead AL, Julious SA, Cooper CL, Campbell MJ. Estimating the sample size for a pilot randomised trial to minimise the overall trial sample size for the external pilot and main trial for a continuous outcome variable. Stat Methods Med Res 2016;25:1057-73.

12. Julious SA. Sample size of 12 per group rule of thumb for a pilot study. Pharm Stat. 2005;4:287-91.
13. Idris AH, Guffey D, Pepe PE, Brown SP, Brooks SC, Callaway CW, et al. Chest compression rates and survival following out-of-hospital cardiac arrest. Crit Care Med. 2015;43:840-8.
14. Yeung J, Meeks R, Edelson D, Gao F, Soar J, Perkins GD. The use of CPR feedback/prompt devices during training and CPR performance: A systematic review. Resuscitation. 2009;80:743-51.
15. Karageorghis CI, Priest DL. Music in the exercise domain: a review and synthesis (Part II). Int Rev Sport Exerc Psychol. 2012;5:67-84.
16. Eldridge SM, Chan CL, Campbell MJ, Bond CM, Hopewell S, Thabane L, et al. CONSORT 2010 statement: extension to randomised pilot and feasibility trials. BMJ. 2016;355:i5239.
17. Wik L, Kramer-Johansen J, Myklebust H, Sørebø H, Svensson L, Fellows B, Steen PA. Quality of cardiopulmonary resuscitation during out-of-hospital cardiac arrest. JAMA. 2005;293:299-304.