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Effects Of Massed And Distributed Practice On Cricket Bowling Accuracy

Indri Nuravica* Mastri Juniarto, and Iwan Setiawan, Eko Prabowo
Physical Education, Faculty of Sports Science, Universitas Negeri Jakarta, Indonesia
Corresponding Author: Indri Nuravica, email: indri.nuravica01@gmail.com

Abstract

Objectives: This study compared changes in cricket bowling accuracy following massed and distributed practice among university cricket club members.

Materials and Methods: A two-group pretest–posttest experiment involved 24 of 32 active members. Participants were assigned on the basis of baseline scores to massed-practice (n = 12) and distributed-practice (n = 12) groups. Both groups completed 14 sessions. Accuracy was assessed from six deliveries directed toward a target area and the stumps. Paired- and independent-samples t tests were conducted at the 5% level.

Results: The massed-practice group improved from 2.33 ± 1.30 to 4.33 ± 1.56; $t(11) = 4.690$, $p = .001$, $d_z = 1.35$. The distributed-practice group changed from 2.17 ± 1.34 to 2.83 ± 1.59; $t(11) = 0.938$, $p = .368$, $d_z = 0.27$. Posttest scores differed between groups, $t(22) = 2.338$, $p = .029$, whereas the between-group difference in change scores was not significant, $t(22) = 1.609$, $p = .122$.

Conclusions: Massed practice produced a large within-group improvement, whereas distributed practice did not produce a significant change. However, the nonsignificant between-group difference in change scores prevents a definitive causal claim of superiority. Larger randomized studies with retention tests are needed.

Keywords: bowling accuracy; cricket; distributed practice; massed practice; motor learning

Introduction

Bowling is a central cricket skill because it limits scoring opportunities and creates the possibility of taking wickets. Accuracy depends not only on the release action but also on consistent coordination across the entire movement sequence. Bowling tests should therefore use clearly defined targets, standardized procedures, and sufficient trials to detect meaningful performance changes (Feros et al., 2018a, 2018b).

Practice distribution is an important decision in motor learning. Massed practice allocates relatively long periods to performance with minimal rest, whereas distributed practice inserts longer rest intervals between trials or practice bouts. Their effects are not uniform because task complexity, experience, fatigue, and testing conditions can modify the learning response (Newell et al., 1988; Panchuk et al., 2013).

Evidence from sport-specific skills remains mixed. Fuentes-García et al. (2022) showed that practice schedules can produce different acquisition and retention patterns in the tennis forehand. In pace bowling, training must balance speed and accuracy because improvement in one component does not necessarily improve the other (Feros et al., 2020; Ramachandran et al., 2022). This study therefore compared changes in bowling accuracy after massed and distributed practice among members of the Universitas Negeri Jakarta cricket club.

Materials and Methods

Study design. A two-group pretest–posttest experimental design was used. Baseline assessment preceded the intervention and posttesting followed completion of all sessions. The study was conducted at the cricket nets of Universitas Negeri Jakarta in December 2023.

Participants. The population comprised 32 active university cricket club members. Twenty-four participants were selected by random sampling. They were matched on baseline performance and assigned by odd–even order to a massed-practice group (n = 12) and a distributed-practice group (n = 12).

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Intervention. Both groups completed 14 morning and afternoon practice sessions. In massed practice, each participant bowled continuously for approximately 10 minutes before another participant took a turn. In distributed practice, participants delivered one ball before rotating, thereby creating an interval between successive deliveries. Session volume followed the source training program.

Instrument and procedures. Each participant completed six deliveries toward a target area and the stumps. A delivery was successful when it entered the target line and hit the stumps; wides and no-balls were unsuccessful. The summary score ranged from 1 to 5 according to the study scoring sheet. Equipment included cricket nets, cricket balls, markers, and recording materials.

Statistical analysis. Individual scores reported in the source appendices were re-audited. Means and standard deviations summarized the data. Within-group changes were evaluated using paired-samples t tests with d_z effect sizes. Posttest and change-score differences were examined using independent-samples t tests. Statistical significance was set at $p < .05$.

Table 1. Study design and intervention

Component	Massed practice	Distributed practice
Participants	12	12
Sessions	14	14
Practice pattern	Continuous bowling for ~10 min	One delivery, then rotation
Assessment	6 target deliveries	6 target deliveries

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Results

Baseline scores were similar in the massed-practice (2.33 ± 1.30) and distributed-practice (2.17 ± 1.34) groups. At posttest, the corresponding scores were 4.33 ± 1.56 and 2.83 ± 1.59.

Reanalysis of the individual scores identified a significant improvement in the massed-practice group but not in the distributed-practice group. Posttest scores differed significantly. Nevertheless, the change-score comparison—the more direct test of whether improvement differed between groups—did not reach statistical significance.

Table 2. Descriptive statistics for bowling accuracy

Group	n	Pretest, Mean ± SD	Posttest, Mean ± SD	Change, Mean ± SD
Massed practice	12	2.33 ± 1.30	4.33 ± 1.56	2.00 ± 1.48
Distributed practice	12	2.17 ± 1.34	2.83 ± 1.59	0.67 ± 2.46

Table 3. Inferential analysis

Comparison	t	df	p	Effect size
Massed: pretest–posttest	4.690	11	.001	$d_z = 1.35$
Distributed: pretest–posttest	0.938	11	.368	$d_z = 0.27$
Posttest: between groups	2.338	22	.029	—
Change score: between groups	1.609	22	.122	—

Note. Statistics were recalculated from the individual scores reported in the source appendices.

Discussion

The principal finding was a large improvement in bowling accuracy during the massed-practice intervention. Consecutive repetitions may have provided frequent opportunities to adjust line, length, and release position. This pattern is broadly consistent with Fuentes-García et al. (2022), who showed that the spacing of practice can influence sport-skill acquisition, although the preferred schedule may depend on the task and phase of learning.

The smaller change under distributed practice should not be interpreted as evidence that rest intervals are generally detrimental. Motor-learning research indicates that practice distribution interacts with task characteristics, experience, and retention interval (Newell et al., 1988; Panchuk et al., 2013). Distributed practice may be advantageous when fatigue compromises movement quality or when long-term retention is the primary outcome. Because this study used only an immediate posttest, it cannot determine which schedule better supports retention.

In cricket, accuracy should be considered alongside speed and consistency. Feros et al. (2018a) documented substantial variation in fast-bowling assessment, and Feros et al. (2018b) emphasized test reliability and sensitivity. Intervention research has also shown that gains in release speed may occur at the expense of accuracy (Feros et al., 2020). Ramachandran et al. (2022) similarly concluded that the intervention evidence for bowling performance remains limited and methodologically variable.

Interpretation must distinguish within-group significance from a between-group treatment difference. A significant result in one group and a nonsignificant result in another does not itself demonstrate that the groups changed differently. Here, the direct change-score comparison yielded $p = .122$. The data therefore support a strong improvement within the massed-practice group, but they do not conclusively establish its superiority.

Limitations include the small sample, limited participant characteristics, odd–even matched allocation, a narrow scoring range, and the absence of retention testing and formal fidelity monitoring. Future studies should use concealed randomization, report age and playing experience, establish interrater reliability, employ a more sensitive target-based test, and include retention and transfer outcomes.

Conclusions

Among 24 university cricket club members, massed practice produced a large and significant improvement in bowling accuracy, whereas the distributed-practice change was not significant. However, the between-group difference in change scores was also not significant. Massed practice may therefore be considered for short-term performance development, but its superiority over distributed practice requires confirmation in larger studies with retention testing.

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Conflict of Interest

The author declares no conflict of interest.

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