Electrolyte Beverage Consumption On Training Disntance In Swimmers

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INTRODUCTION

BACKGROUND

Swimming Performance
Swimming performance is influenced not only by technical skills and muscle strength, but also by **physiological stability** during prolonged training.

Fluid & Electrolyte Loss
During endurance training, swimmers lose **fluids and electrolytes** through sweat, even in an aquatic environment.

Neuromuscular Function
Electrolyte imbalance can impair **nerve impulse transmission** and **muscle contraction–relaxation** mechanisms.

Endurance Performance
Impaired neuromuscular function may **accelerate fatigue** and **reduce swimming endurance and distance**.

SWIMMING TRAINING
↓
FLUID & ELECTROLYTE LOSS
↓
NEUROMUSCULAR FUNCTION IMPAIRED
↓
MUSCLE FATIGUE INCREASES
↓
SWIMMING DISTANCE DECREASES

PREVIOUS STUDIES
Electrolytes play an important role in maintaining fluid balance, nerve transmission, and muscle contraction. Electrolyte drinks help maintain physiological stability during prolonged exercise.

(Kerksick et al., 2018; Evans et al., 2019)

RESEARCH GAP
Most studies have focused on hydration status or physiological responses. Limited studies have examined the effect of electrolyte drink consumption on measurable training performance indicators, particularly swimming distance.

IMPORTANCE OF STUDY
Understanding the effect of electrolyte beverage consumption on training distance can provide evidence-based recommendations to support nutrition strategies in young swimmers.

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INTRODUCTION

RESEARCH GAP & OBJECTIVE

PREVIOUS STUDIES

Electrolytes are essential for **fluid balance, nerve transmission,** and **muscle contraction.**
(Kerksick et al., 2018; Thomas et al., 2021)

Electrolyte drinks help maintain physiological stability and support **endurance performance** during moderate to high-intensity exercise.
(Evans et al., 2019; Maughan & Shirreffs, 2010)

Most studies focus on hydration status or general physiological responses.
(Casa et al., 2019)

RESEARCH GAP

Limited studies have examined the effect of **electrolyte drink** consumption on **measurable training performance indicators,** particularly **swimming distance,** in **adolescent swimmers.**

There is a need for evidence that **electrolyte drinks** can **improve performance outcomes** during prolonged training.

OBJECTIVE

This study aimed to examine differences in 60-minute **swimming distance** based on **electrolyte drink consumption** in adolescent swimmers **aged 12–13 years.**

Providing evidence to support nutrition and hydration strategies in young swimmers' training.

METHODS

STUDY DESIGN & PROCEDURES

STUDY DESIGN

Comparative study with **two-group design.**

Electrolyte Group VS Non-Electrolyte Group

60-minute continuous swimming test

Purpose: To examine differences in 60-minute swimming distance based on electrolyte drink consumption.

PARTICIPANTS

- Adolescent swimmers
- aged **12–13 years**
- Competitive level
- Total of 8 swimmers

INTERVENTION GROUPS

ELECTROLYTE GROUP (n = 4)	INON-ELECTROLYTE GROUPP (n = 4)
Consumed electrolyte drink during training	Did not consume electrolyte drink
Electrolyte beverage provided in accordance with training guidelines.	Only plain water was allowed.

PROCEDURE

Pre-test preparation: Standardized warm-up and test instructions.

60-minute continuous swimming test: Swimmers performed continuous swimming for 60 minutes.

Performance measurement: Total distance (meters) covered during 60 minutes was recorded.

OUTCOME & ANALYSIS

- **Primary outcome:** Total swimming distance (m)
- **Statistical analysis:**

Independent Samples t-test
(normality tested using Shapiro–Wilk test)
Significance level: $p < 0.05$

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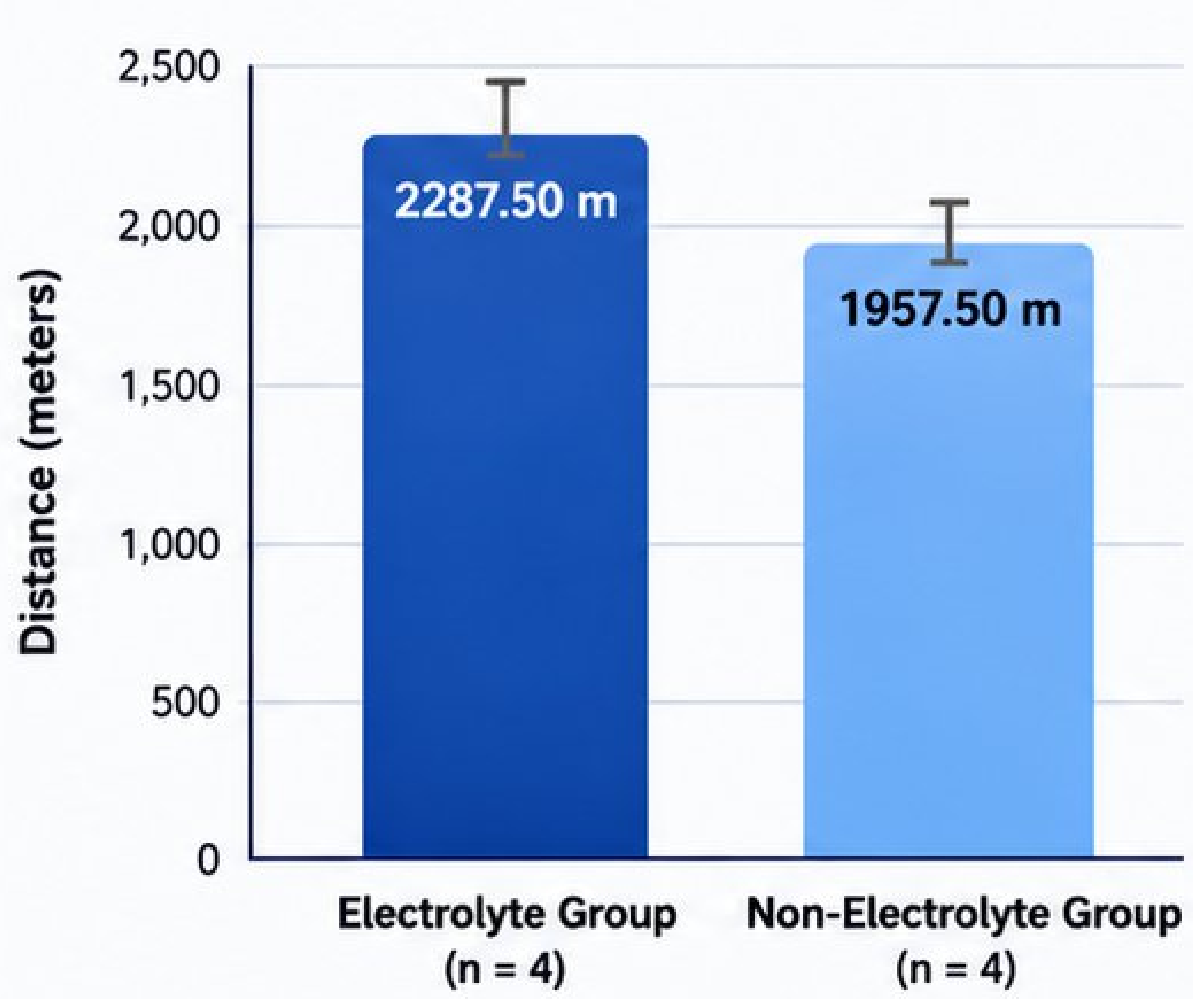
RESULTS

SWIMMING DISTANCE IN 60 MINUTES

Mean Swimming Distance



Descriptive Statistics

Group	Mean Distance (meters)	SD (meters)
Electrolyte Group (n = 4)	2287.50	105.00
Non-Electrolyte Group (n = 4)	1957.50	113.25

Statistical Analysis

Independent Samples t-test

$t(6) = 4.274$; **$p = 0.005$**

Mean difference: **330 meters**

Key Findings

- The electrolyte group covered a **higher swimming distance** than the non-electrolyte group.
- The difference between groups was **statistically significant ($p = 0.005$)**.
- Electrolyte drink consumption was associated with **better endurance performance** during prolonged swimming.

Adolescent swimmers who consumed electrolyte drinks achieved a **significantly longer swimming distance** in 60 minutes compared to those who did not consume electrolyte drinks.

DISCUSSION

INTERPRETATION OF FINDINGS

1. ELECTROLYTES SUPPORT PHYSIOLOGICAL FUNCTION

Electrolytes such as sodium and chloride maintain **fluid balance** and **plasma volume.**

Potassium, calcium, and magnesium are essential for **nerve impulse transmission** and **muscle contraction–relaxation.**

Optimal electrolyte balance helps maintain neuromuscular efficiency and **delays fatigue** onset.

2. EXPLANATION OF RESULTS

Electrolyte Group		Non-Electrolyte Group
2287.50 m	>	1957.50 m

The electrolyte group achieved a significantly longer swimming distance (mean difference = 330 m; $p = 0.005$), indicating that electrolyte drink consumption contributes to **better endurance performance** during prolonged swimming.

3. CONSISTENCY WITH PREVIOUS STUDIES

Previous studies reported that electrolyte beverages help maintain **physiological stability** and support **endurance performance** during prolonged exercise (Evans et al., 2019; Maughan & Shirreffs, 2010).

The results of this study are in line with these findings, showing **improved performance** in terms of **swimming** distance.

Despite the small sample size, the findings provide **preliminary evidence** for the importance of electrolyte intake in young swimmers' training.

4. PRACTICAL IMPLICATION

Electrolyte drink consumption during training → Maintains hydration and electrolyte balance → Supports neuromuscular function and delays fatigue → Leads to improved endurance performance (swimming distance)

5. LIMITATION

- Small sample size (n = 8)
- Short duration (60-minute test)
- Only one performance indicator (distance)
- Future studies should involve larger samples and additional variables (e.g., heart rate, blood markers).

CONCLUSION

This study demonstrated that **electrolyte drink consumption significantly improved 60-minute swimming distance** in adolescent swimmers aged 12–13 years. Swimmers who consumed electrolyte drinks achieved a greater distance compared to those who consumed only plain water. These findings indicate that maintaining electrolyte balance supports **hydration, neuromuscular function**, and prolonged **exercise capacity**. Therefore, electrolyte drink consumption may be considered an **effective nutritional strategy** to enhance **endurance performance** during swimming training, although further studies with larger sample sizes and more rigorous experimental designs are recommended.

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