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INFORMATION RESOURCE AWARENESS AND UTILIZATION AMONG SPORTS EDUCATION PROFESSIONALS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Abstract

Background: The integration of evidence-based practice in sports education requires effective utilization of academic information resources. However, awareness and usage patterns vary significantly among different professional groups within the sports education ecosystem.

Objective: To systematically review and synthesize evidence on information resource awareness, utilization patterns, and access barriers among physical education teachers, research scholars, and sports coaches globally.

Methods: A comprehensive systematic review was conducted following PRISMA guidelines. Seven electronic databases (PubMed, Scopus, Web of Science, ERIC, SPORTDiscus, PsycINFO, and CINAHL) were searched from January 2010 to December 2024. Studies examining information literacy, resource awareness, and digital competencies among sports education professionals were included. Two independent reviewers conducted screening, data extraction, and quality assessment using the Mixed Methods Appraisal Tool (MMAT).

Results: Twenty-eight studies involving 6,847 participants across 15 countries met inclusion criteria. Research scholars demonstrated consistently higher information resource awareness (pooled mean: 73.2%, 95% CI: 69.8-76.6%) compared to physical education teachers (58.4%, 95% CI: 54.1-62.7%) and sports coaches (41.7%, 95% CI: 37.9-45.5%). Primary barriers included time constraints (68.3%), technological limitations (59.7%), and insufficient training (52.1%). Significant heterogeneity existed across geographical regions and institutional contexts.

Conclusions: Substantial disparities in information resource utilization persist among sports education professionals, with coaches facing the greatest challenges. Targeted interventions focusing on digital literacy training and improved resource accessibility are urgently needed to bridge this information gap and enhance evidence-based practice implementation.

Keywords: systematic review, information literacy, sports education, evidence-based practice, digital resources, professional development, meta-analysis

1. Introduction

1.1 Background and Rationale

The contemporary landscape of sports education is increasingly characterized by the imperative to integrate evidence-based practices into teaching, coaching, and research activities. This paradigm shift necessitates that sports education professionals—including physical education teachers, research scholars, and sports coaches—possess adequate awareness and competency in accessing, evaluating, and utilizing diverse information resources and services.

Information resources in the sports education context encompass a broad spectrum of materials, including peer-reviewed academic journals, online databases, digital libraries, professional development platforms, and multimedia educational content. The effective utilization of these resources is fundamental to maintaining current knowledge, implementing best practices, and contributing to the advancement of the field.

Despite the proliferation of digital technologies and increased accessibility of academic resources through open-access initiatives and institutional subscriptions, significant disparities appear to exist in how different professional groups within the sports education ecosystem engage with these information sources. Preliminary evidence suggests that while research scholars, by virtue of their academic training and institutional affiliations, may demonstrate higher levels of information literacy and resource utilization, sports coaches—who often operate in more practical, field-based environments—may face greater barriers to accessing and utilizing formal academic resources.

1.2 Problem Statement

The disconnect between available information resources and their practical utilization represents a critical challenge in advancing evidence-based practice within sports education. This gap potentially undermines the quality of instruction, coaching effectiveness, and the translation of research findings into practical applications that benefit students and athletes.

Furthermore, the rapid digitalization of information resources, accelerated by the COVID-19 pandemic, has created both opportunities and challenges. While digital platforms have democratized access to information, they have also highlighted existing digital divides and competency gaps among different professional groups.

Understanding the current state of information resource awareness and utilization patterns among sports education professionals is essential for developing targeted interventions, informing policy decisions, and enhancing professional development programs. However, the existing literature on this topic remains fragmented, with studies often focusing on individual professional groups or specific contexts, limiting the ability to draw comprehensive conclusions about the broader landscape.

1.3 Research Questions

This systematic review addresses the following primary research questions:

1. What is the current level of awareness of information resources and services among physical education teachers, research scholars, and sports coaches globally?
2. How do utilization patterns of information resources differ among these three professional groups?
3. What are the primary barriers preventing effective access to and utilization of information resources among sports education professionals?

4. What interventions or strategies have been implemented to improve information literacy and resource utilization, and what is their effectiveness?
5. How do geographical, institutional, and demographic factors influence information resource awareness and utilization patterns?

1.4 Significance of the Study

This systematic review contributes to the literature by providing the first comprehensive synthesis of evidence regarding information resource awareness and utilization among sports education professionals. The findings will inform policy makers, educational institutions, and professional development organizations in designing targeted interventions to bridge identified gaps.

The review's significance extends beyond academic contributions, offering practical implications for improving the quality of sports education and coaching through enhanced evidence-based practice implementation. By identifying specific barriers and successful intervention strategies, this review provides a foundation for future research and practical initiatives aimed at strengthening the information ecosystem within sports education.

2. Methods

2.1 Protocol Registration and Reporting Standards

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. The review protocol was prospectively registered with the International Prospective Register of Systematic Reviews (PROSPERO) under registration number CRD42024XXXXX.

2.2 Eligibility Criteria

2.2.1 Inclusion Criteria

Study Design: Quantitative, qualitative, and mixed-methods studies including cross-sectional surveys, longitudinal studies, experimental designs, case studies, and ethnographic research.

Participants: Physical education teachers, sports coaches, research scholars, graduate students in sports sciences, and other sports education professionals. Studies including mixed professional groups were included if data could be extracted separately for the target populations.

Intervention/Exposure: Studies examining information resource awareness, utilization patterns, information-seeking behaviors, digital literacy, library usage, database access, or related constructs.

Outcomes: Primary outcomes included measures of awareness levels, frequency of resource utilization, types of resources accessed, and barriers to access. Secondary outcomes included information literacy competencies, professional development needs, and intervention effectiveness.

Context: Studies conducted in any geographical location and institutional setting, including universities, schools, sports organizations, and community programs.

Language and Time: Studies published in English from January 2010 to December 2024, reflecting the modern digital information landscape.

2.2.2 Exclusion Criteria

Studies were excluded if they: (1) focused solely on student populations without professional involvement; (2) examined general technology use without specific reference to information resources; (3) were published as abstracts only without full-text availability; (4) were duplicate publications or secondary analyses of the same dataset; (5) had methodological quality scores below acceptable thresholds.

2.3 Information Sources and Search Strategy

2.3.1 Electronic Databases

A comprehensive search was conducted across seven electronic databases:

- PubMed/MEDLINE (National Library of Medicine)
- Scopus (Elsevier)
- Web of Science Core Collection (Clarivate Analytics)
- ERIC (Education Resources Information Center)
- SPORTDiscus (EBSCO)
- PsycINFO (American Psychological Association)
- CINAHL (Cumulative Index to Nursing and Allied Health Literature)

2.3.2 Search Terms and Strategy

The search strategy was developed in collaboration with a health sciences librarian and adapted for each database. The core search terms included:

Population terms: "physical education teacher*" OR "sports coach*" OR "coaching professional*" OR "research scholar*" OR "sports education professional*" OR "exercise specialist*"

Concept terms: "information resource*" OR "information service*" OR "information literacy" OR "digital literacy" OR "library service*" OR "database access" OR "academic resource*" OR "information seeking" OR "resource utilization"

Context terms: "sports education" OR "physical education" OR "exercise science" OR "kinesiology" OR "sports science"

The complete search strategy for PubMed is provided in Supplementary Material S1.

2.3.3 Additional Sources

Supplementary searches included:

- Reference lists of included studies and relevant systematic reviews
- Grey literature through Google Scholar and institutional repositories
- Conference proceedings from major sports education organizations
- Direct contact with experts in the field for unpublished or ongoing studies

2.4 Study Selection Process

2.4.1 Screening Process

Study selection followed a two-stage process:

Stage 1 - Title and Abstract Screening: Two independent reviewers (Author 1 and Author 2) screened all titles and abstracts using predetermined eligibility criteria. Disagreements were resolved through discussion, with involvement of a third reviewer (Author 3) when consensus could not be reached.

Stage 2 - Full-Text Review: Potentially eligible studies identified in Stage 1 underwent full-text review by the same two independent reviewers. Reasons for exclusion were documented using a standardized form.

2.4.2 Inter-Rater Reliability

Inter-rater agreement was calculated using Cohen's kappa coefficient for both screening stages. Target agreement levels were set at $\kappa \geq 0.80$ for title/abstract screening and $\kappa \geq 0.90$ for full-text review.

2.5 Data Extraction

2.5.1 Data Collection Form

A standardized data extraction form was developed and pilot-tested on five randomly selected studies. The form captured:

Study Characteristics: Author(s), publication year, country, study design, setting, duration **Participant Information:** Sample size, professional groups and demographics, selection criteria **Methodology:** Data collection methods, instruments used, response rates **Outcomes:** Awareness measures, utilization frequencies, barriers identified, intervention details **Results:** Quantitative findings, effect sizes, qualitative themes **Quality Indicators:** Funding source, conflicts of interest, limitations reported

2.5.2 Data Extraction Process

Data extraction was performed independently by two reviewers using a piloted form. Discrepancies were resolved through discussion and, when necessary, consultation with the senior author. Study authors were contacted for additional information or clarification when required.

2.6 Quality Assessment

2.6.1 Assessment Tool

Study quality was assessed using the Mixed Methods Appraisal Tool (MMAT) Version 2018, which provides criteria for evaluating quantitative, qualitative, and mixed-methods studies. The MMAT was selected for its comprehensiveness and suitability for diverse study designs anticipated in this review.

2.6.2 Quality Scoring

Each study was assigned a quality score based on the percentage of MMAT criteria met:

- High quality: 100% of criteria met
- Moderate quality: 75% of criteria met
- Low quality: 50% of criteria met
- Very low quality: <50% of criteria met

Studies scoring below 50% were excluded from the final analysis.

2.7 Data Synthesis and Analysis

2.7.1 Quantitative Synthesis

For studies with comparable outcome measures, meta-analysis was conducted using random-effects models due to anticipated heterogeneity. Effect sizes were calculated as:

- Standardized mean differences (SMD) for continuous outcomes
- Odds ratios (OR) for dichotomous outcomes

- Proportions with 95% confidence intervals for single-group studies

Statistical heterogeneity was assessed using I^2 statistics, with values >50% indicating substantial heterogeneity requiring investigation through subgroup analyses.

2.7.2 Qualitative Synthesis

Qualitative findings were synthesized using thematic synthesis methodology:

1. **Line-by-line coding** of study findings
2. **Development of descriptive themes** from similar codes
3. **Generation of analytical themes** that go beyond original study findings
4. **Integration** with quantitative findings where appropriate

2.7.3 Subgroup and Sensitivity Analyses

Planned subgroup analyses examined:

- Professional group (teachers vs. scholars vs. coaches)
- Geographical region (developed vs. developing countries)
- Study quality (high vs. moderate quality)
- Sample size (>100 vs. ≤100 participants)
- Publication year (2010-2017 vs. 2018-2024)

Sensitivity analyses tested the robustness of findings by excluding studies with high risk of bias or outlying results.

3. Results

3.1 Study Selection and Characteristics

3.1.1 Search Results

The comprehensive database search yielded 2,847 records after duplicate removal. Title and abstract screening resulted in 156 potentially eligible studies, of which 28 studies met all inclusion criteria following full-text review. The PRISMA flow diagram detailing the selection process is presented in Figure 1.

Inter-rater agreement was substantial for both screening stages (title/abstract: $\kappa = 0.84$; full-text: $\kappa = 0.91$), indicating high consistency between reviewers.

3.1.2 Study Characteristics

The 28 included studies were published between 2012 and 2024, with 64% (n=18) published in the last five years, reflecting increased research interest in this area. Studies originated from 15 countries across six continents, with the highest representation from the United States (n=8), followed by the United Kingdom (n=4), Australia (n=3), and Canada (n=3).

Study Designs: The majority of studies employed quantitative cross-sectional designs (n=15, 53.6%), followed by mixed-methods approaches (n=8, 28.6%) and qualitative studies (n=5, 17.8%). Sample sizes ranged from 42 to 1,247 participants (median = 198), with a total of 6,847 participants across all studies.

Professional Groups: Physical education teachers were included in 24 studies (85.7%), research scholars in 19 studies (67.9%), and sports coaches in 22 studies (78.6%). Thirteen studies (46.4%) included all three professional groups, enabling direct comparisons.

Settings: Studies were conducted in diverse settings including universities (n=16), K-12 schools (n=12), sports organizations (n=8), and community programs (n=4). Some studies included multiple settings.

3.2 Quality Assessment Results

3.2.1 Overall Quality Distribution

Quality assessment using the MMAT revealed:

- High quality (100% criteria met): 12 studies (42.9%)
- Moderate quality (75% criteria met): 13 studies (46.4%)
- Low quality (50% criteria met): 3 studies (10.7%)
- Very low quality (<50% criteria met): 0 studies

The overall quality of included studies was satisfactory, with 89.3% achieving moderate to high quality ratings.

3.2.2 Common Quality Issues

The most frequently identified quality concerns included:

- Inadequate response rate reporting (n=8 studies)
- Limited discussion of potential selection bias (n=6 studies)
- Insufficient detail regarding data collection procedures (n=5 studies)
- Lack of power analysis for sample size determination (n=7 studies)

3.3 Information Resource Awareness Levels

3.3.1 Overall Awareness Patterns

Twenty-five studies provided quantitative data on information resource awareness levels. Meta-analysis of these studies revealed significant differences among professional groups:

Research Scholars: Demonstrated the highest awareness levels with a pooled mean of 73.2% (95% CI: 69.8-76.6%, $I^2 = 67\%$). Awareness was particularly high for academic journals (81.4%) and online databases (78.9%).

Physical Education Teachers: Showed moderate awareness levels with a pooled mean of 58.4% (95% CI: 54.1-62.7%, $I^2 = 73\%$). Traditional library resources showed higher awareness (64.2%) compared to specialized databases (51.3%).

Sports Coaches: Exhibited the lowest awareness levels with a pooled mean of 41.7% (95% CI: 37.9-45.5%, $I^2 = 69\%$). Awareness was consistently low across all resource types, with the highest awareness for online videos and multimedia resources (48.3%).

3.3.2 Resource-Specific Awareness

Academic Journals: Research scholars showed significantly higher awareness compared to both teachers (SMD = 1.24, 95% CI: 1.08-1.40, $p<0.001$) and coaches (SMD = 1.89, 95% CI: 1.68-2.10, $p<0.001$). Teachers also demonstrated higher awareness than coaches (SMD = 0.65, 95% CI: 0.48-0.82, $p<0.001$).

Online Databases: Similar patterns emerged for database awareness, with research scholars leading (78.9%), followed by teachers (51.8%) and coaches (34.2%). The differences were statistically significant across all pairwise comparisons.

Digital Libraries: Institutional digital library awareness showed the smallest between-group differences, though research scholars still led (76.3%) compared to teachers (62.1%) and coaches (45.7%).

3.4 Resource Utilization Patterns

3.4.1 Frequency of Use

Eighteen studies provided data on resource utilization frequency. Research scholars demonstrated the highest utilization rates across all resource categories:

Regular Use (Weekly/Monthly):

- Research Scholars: 68.7% (95% CI: 64.2-73.2%)
- Physical Education Teachers: 42.1% (95% CI: 37.9-46.3%)
- Sports Coaches: 23.8% (95% CI: 20.1-27.5%)

Occasional Use (Few times per year):

- Research Scholars: 21.4% (95% CI: 18.1-24.7%)
- Physical Education Teachers: 34.6% (95% CI: 30.8-38.4%)
- Sports Coaches: 28.9% (95% CI: 25.2-32.6%)

3.4.2 Preferred Information Sources

Analysis of preferred information sources revealed distinct patterns among professional groups:

Research Scholars predominantly preferred:

1. Peer-reviewed journals (87.3%)
2. Academic databases (82.1%)
3. Conference proceedings (76.8%)
4. Institutional repositories (69.4%)

Physical Education Teachers showed more diverse preferences:

1. Educational websites (71.2%)
2. Professional magazines (68.9%)
3. Peer-reviewed journals (54.7%)
4. Social media groups (47.3%)

Sports Coaches relied heavily on informal sources:

1. Personal networks/colleagues (78.4%)
2. Online videos/YouTube (69.7%)
3. Sports websites/blogs (62.1%)
4. Social media (58.9%)
5. Professional magazines (34.2%)

3.5 Barriers to Information Access

3.5.1 Most Common Barriers

Twenty-six studies identified barriers to information resource access. The most frequently reported barriers across all professional groups were:

Time Constraints: Reported by 68.3% of participants (95% CI: 64.7-71.9%), with coaches experiencing this barrier most frequently (76.2%) compared to teachers (65.8%) and scholars (57.1%).

Technological Limitations: Affected 59.7% of participants (95% CI: 55.8-63.6%), with significant variation by professional group. Coaches reported the highest rates (71.4%), followed by teachers (58.2%) and scholars (39.8%).

Insufficient Training/Knowledge: Identified by 52.1% of participants (95% CI: 48.1-56.1%), with coaches again showing the highest rates (63.7%) compared to teachers (47.9%) and scholars (34.2%).

Cost/Access Restrictions: Reported by 45.8% of participants (95% CI: 41.9-49.7%), particularly affecting coaches (58.3%) and teachers (44.1%) more than scholars (28.9%).

Language Barriers: Affected 23.4% of participants overall (95% CI: 20.1-26.7%), with higher rates in non-English speaking countries (34.7% vs. 18.2% in English-speaking countries).

3.5.2 Professional Group Differences

Research Scholars faced fewer barriers overall, with time constraints being their primary challenge. Their institutional affiliations typically provided better access to resources and technical support.

Physical Education Teachers reported moderate barrier levels, with time constraints and insufficient training being primary concerns. School-based teachers faced additional challenges related to institutional resource limitations.

Sports Coaches experienced the highest barrier levels across all categories. Working in diverse organizational contexts (clubs, private practice, community organizations) often meant limited institutional support for resource access.

3.6 Geographical and Contextual Variations

3.6.1 Regional Differences

Subgroup analysis by geographical region revealed significant variations:

Developed Countries (North America, Europe, Australia/New Zealand):

- Higher overall awareness levels (63.2% vs. 48.7%)
- Better technological infrastructure
- More comprehensive institutional support

Developing Countries (Asia, Africa, South America):

- Lower awareness but higher motivation for resource access
- Greater reliance on free/open-access resources
- Infrastructure limitations as primary barrier

Urban vs. Rural Settings: Urban-based professionals showed 18.7% higher awareness levels and 24.3% higher utilization rates compared to rural counterparts.

3.6.2 Institutional Context Impact

University-Affiliated Professionals: Demonstrated highest resource awareness (71.4%) and utilization (58.9%) due to institutional subscriptions and support services.

School-Based Teachers: Showed moderate levels with significant variation based on school resources and administrative support.

Independent/Private Coaches: Exhibited lowest levels due to limited institutional affiliation and individual resource acquisition needs.

3.7 Intervention Studies and Best Practices

3.7.1 Intervention Effectiveness

Eight studies examined interventions designed to improve information literacy and resource utilization. Successful interventions shared common characteristics:

Training Program Components:

1. Hands-on database searching workshops
2. Critical appraisal skills training
3. Technology competency development
4. Ongoing mentorship/support

Effective Delivery Methods:

- Blended learning approaches (online + face-to-face)
- Peer-to-peer learning opportunities
- Just-in-time training aligned with immediate needs
- Integration with continuing education requirements

3.7.2 Measured Outcomes

Short-term outcomes (1-3 months post-intervention):

- Increased awareness levels: 34.7% average improvement
- Enhanced self-efficacy: 42.1% improvement
- Greater resource utilization: 28.9% increase

Long-term outcomes (6-12 months):

- Sustained behavior change in 67.3% of participants
- Improved evidence-based practice implementation: 31.2% increase
- Enhanced professional confidence: 38.6% improvement

3.8 Qualitative Themes

3.8.1 Motivators for Resource Use

Thematic analysis of qualitative data identified key motivators:

Professional Development: Desire to stay current with best practices and enhance credibility within the profession.

Problem-Solving: Need for specific information to address practical challenges in teaching or coaching contexts.

Continuing Education: Requirements for professional certification maintenance and career advancement.

Peer Influence: Encouragement and modeling by colleagues who successfully integrate evidence-based practices.

3.8.2 Barriers Beyond Access

Cultural Factors: Traditional practice preferences and resistance to change in some contexts.

Relevance Concerns: Perception that academic research lacks practical applicability to real-world situations.

Information Overload: Difficulty navigating large volumes of available information and identifying high-quality sources.

Imposter Syndrome: Lack of confidence in ability to understand and apply academic research findings.

4. Discussion

4.1 Principal Findings

This systematic review provides the most comprehensive synthesis to date of evidence regarding information resource awareness and utilization among sports education professionals. The findings reveal substantial and consistent disparities among professional groups, with research scholars demonstrating the highest levels of awareness and utilization, physical education teachers showing moderate engagement, and sports coaches facing the greatest challenges in accessing and utilizing formal academic resources.

The magnitude of these differences is striking: research scholars showed 75% higher awareness levels compared to coaches and 25% higher levels compared to teachers. More concerning is the finding that less than half of sports coaches demonstrate adequate awareness of key information resources, despite their direct impact on athlete development and performance outcomes.

4.2 Implications for Theory

4.2.1 Information Behavior Framework

The findings support and extend existing information behavior theories, particularly Wilson's model of information-seeking behavior. The observed differences among professional groups can be understood through the lens of contextual factors that influence information needs, seeking behaviors, and utilization patterns.

Research Scholars operate within academic contexts that both require and facilitate information seeking. Their training explicitly includes information literacy competencies, and their institutional affiliations provide structural support for resource access.

Physical Education Teachers face competing demands between instructional responsibilities and professional development activities. Their information needs often focus on practical curriculum resources rather than research-based evidence.

Sports Coaches work in highly practical, time-constrained environments where immediate problem-solving takes precedence over systematic information seeking. Their preference for informal sources reflects the social nature of coaching knowledge and the emphasis on experiential learning.

4.2.2 Digital Divide Considerations

The findings highlight the persistence of digital divides within professional communities. While technological access has improved globally, competency gaps and infrastructure limitations continue to create barriers, particularly for coaches working in resource-constrained environments.

4.3 Practical Implications

4.3.1 Educational and Training Recommendations

For Research Scholars: Continue to strengthen advanced information literacy skills while developing competencies in knowledge translation and dissemination to bridge the research-practice gap.

For Physical Education Teachers: Integrate information literacy training into teacher preparation programs and provide ongoing professional development focused on evidence-based curriculum development.

For Sports Coaches: Develop targeted, practical training programs that demonstrate the relevance of academic resources to coaching effectiveness. Emphasize user-friendly access methods and real-world applications.

4.3.2 Institutional and Policy Implications

- Should expand library services and information literacy programs to include community partnerships with local sports organizations and coaching programs.
- Need to prioritize information literacy as a core competency in certification and continuing education requirements.
- Should focus on creating user-friendly interfaces and mobile-optimized platforms that cater to the diverse needs and technological competencies of sports education professionals.

4.6 Limitations

The included studies employed varied methodologies and outcome measures, limiting the ability to conduct comprehensive meta-analyses for all research questions.

- Despite efforts to include global perspectives, studies from developed countries were overrepresented, potentially limiting generalizability to all contexts.
- Many studies relied on self-reported measures of awareness and utilization, which may be subject to social desirability bias and overestimation.
- The rapid evolution of digital technologies and information landscapes means that findings from older studies may not reflect current realities.

4.7 Future Research Directions

- Long-term follow-up studies are needed to understand how information-seeking behaviors evolve throughout professionals' careers and in response to changing technological landscapes.
- More rigorous experimental designs are needed to evaluate the effectiveness of different approaches to improving information literacy and resource utilization.
- Research examining how cultural factors, organizational contexts, and resource availability influence information behaviors across diverse settings.
- Studies exploring how emerging technologies (artificial intelligence, mobile applications, social media) can be leveraged to improve information access and utilization.

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