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Fostering Management and Leadership Skills in Medical Students via Students' Clubs

Nouf Atiyah Alharthi[1]; Ghaliah Albogami[1]; Reem Alsaif[1]; Nada Mohammed Skaik[1]

[1.] Respiratory Care Department, College of Medical Sciences, Almaarefa University, Diriya, Riyadh, Saudi Arabia

*Correspondence: Obogami@um.edu.sa

Abstract

Background: Leadership and management competencies are increasingly recognized as essential for future healthcare professionals. Student clubs and organizations provide informal yet powerful platforms for experiential leadership learning. However, limited quantitative evidence exists linking such participation with measurable leadership outcomes in undergraduate health-science education. **Objectives:** To examine the relationship between student-club participation, leadership experience, and perceived confidence as a future leader among university students preparing for healthcare professions. **Methods:** A cross-sectional survey of 30 students from diverse academic programs was conducted. Variables included current or past club membership, leadership roles, perceived importance of participation, and self-rated leadership confidence. Pearson correlation and multiple regression analyses were performed to determine associations and predictors. Additionally, findings were contextualized through a targeted review of comparable programs and frameworks in medical education leadership literature. **Results:** Active club membership was significantly correlated with both perceived importance of participation ($r = 0.47$, $p = 0.009$) and leadership confidence ($r = 0.47$, $p = 0.009$). Regression analysis confirmed membership as the only significant predictor of confidence ($\beta = 2.74$, $p = 0.011$), explaining 25.3% of variance ($R^2 = 0.253$). Neither holding a leadership title nor perceived importance alone significantly influenced confidence levels. **Conclusions:** Sustained participation in student clubs, rather than holding formal leadership positions, is most strongly associated with self-perceived leadership confidence. These findings align with evidence from structured leadership programs [11–27], reinforcing that experiential, longitudinal, and peer-driven engagement effectively builds leadership competencies aligned with the Medical Leadership Competency Framework. Integrating and formally recognizing such extracurricular learning within curricula may strengthen future healthcare leadership capacity.

Keywords: Leadership development, medical education, student clubs, experiential learning, self-efficacy, healthcare leadership

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Introduction

Medical personnel need to have strong management and leadership abilities in the complicated healthcare environment of today. Clinical expertise is fundamental, but leadership and teamwork skills inside healthcare organizations have a big impact on patient outcomes and system effectiveness. Student-run organizations offer a special chance to help medical students develop these abilities. Students can improve their comprehension of cooperation, communication, and dispute resolution by taking on leadership responsibilities in these organizations. Using new research that emphasizes the need of leadership development in medical education, this paper investigates how student organizations might promote critical management and leadership skills.

Medical student clubs and societies offer valuable opportunities for developing leadership and management skills, which are essential for future physicians [1]. These extracurricular activities allow students to gain practical experience in people management, teamwork, and conflict resolution [2]. Programs like the Hopkins Health Management Advisory Group provide hands-on experience with healthcare management projects [3]. Students generally show positive attitudes towards leadership education and prefer experiential learning methods [4,5]. Some institutions have implemented student-led leadership training programs, focusing on core competencies such as effective communication and decision-making [6]. These programs often combine didactic and project-based approaches to deliver business and management curricula [7]. Despite the recognized importance of leadership training in medical education, many medical schools still lack formal leadership and management curricula.

The importance of strong management and leadership abilities in medical education is becoming more widely acknowledged. In order to improve patient outcomes and promote teamwork, medical students must not only possess exceptional clinical knowledge but also cultivate strong leadership skills, as required by the changing healthcare landscape [8].

Research indicates that Many medical students start their degrees with little knowledge of leadership concepts, according to research. According to one study, for example, 44% of students had a hazy understanding of leadership, and many did not believe that leadership abilities would be useful in their future positions [9]. This disparity emphasizes how medical curriculum must include organized leadership training.

Clubs and organizations that are run by students offer a useful way to develop these abilities. In order to bridge the gap between academic knowledge and real-world application, these organizations can establish a nurturing environment where students learn from experience and peer interaction [8,9].

Additionally, the move in healthcare toward distributed and collaborative leadership models is consistent with the inclusion of leadership training in student organizations. According to van Diggele et al. [9], students are better equipped to handle the challenges of contemporary healthcare environments when teamwork and shared accountability are emphasized.

Methodology

Study Design

This study employed a cross-sectional, correlational design to examine the association between student-club participation and perceived leadership confidence among undergraduate students enrolled in health-related programs. The design was selected

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to capture existing patterns of engagement and confidence across different student cohorts, consistent with similar leadership and management education studies in medical and allied health curricula [4,15,17].

Participants and Sampling

A convenience sample of 30 university students from various health-professions programs (including medicine, physiotherapy, medical laboratory science, and allied health) participated in the study. Participants were invited through institutional mailing lists and student clubs during the academic semester. Inclusion criteria were: (a) current enrollment in a healthcare-related undergraduate program and (b) voluntary consent to participate. Students from non-health disciplines were excluded to ensure professional relevance.

The sample included both genders and represented a range of academic levels, ensuring diversity of experience in extracurricular participation. Ethical approval for this study was obtained from the institutional review board, and informed consent was collected prior to participation.

Instrumentation and Variables

A structured online questionnaire was developed based on previously validated tools assessing leadership training outcomes in undergraduate medical education [4,15,17]. The instrument comprised four main variables. Club Membership was categorized as current member, previous member, or not a member. Leadership Position assessed whether the participant currently or previously held a formal leadership role within a club. Perceived Importance of Participation was measured using a 5-point Likert scale ranging from 1 (Not important) to 5 (Very important). Leadership Confidence was similarly evaluated on a 5-point Likert scale, with 1 representing "Not confident" and 5 representing "Very confident."

The survey also captured demographic information such as age, gender, academic year, and major. Items were adapted and contextualized from leadership evaluation frameworks, including the Medical Leadership Competency Framework (MLCF) [25] and Kirkpatrick's model of learning evaluation [26], ensuring both conceptual validity and alignment with international standards in leadership education.

Data Collection Procedure

Data were collected via an anonymous online survey hosted on a secure institutional platform. Students were informed about the study purpose, anonymity, and voluntary nature of participation. The estimated completion time was 10 minutes. The survey remained open for two weeks to maximize response rates, with one reminder email sent mid-way through the data collection period.

This self-administered format mirrored methodologies used in previous leadership perception and skills studies among medical students [5,9,15,21], allowing participants to reflect on their learning experiences outside formal coursework.

Data Analysis

All statistical analyses were performed using IBM SPSS (version 28). Descriptive statistics (frequencies, means, standard deviations, and confidence intervals) summarized participant demographics and distribution across variables.

Pearson's correlation coefficients were calculated to assess relationships between club membership, leadership position, perceived importance, and confidence. Strength and direction of associations were interpreted using Cohen's (1988) benchmarks for effect size (small = .10–.29, medium = .30–.49, large ≥ .50).

A multiple linear regression model was then applied to determine the predictive contribution of the three independent variables—club membership, leadership position, and perceived importance of participation—on the dependent variable, leadership confidence. Significance was established at $p < .05$. Model fit and explained variance (R^2) were reported to contextualize the overall predictive strength.

This analytic strategy aligns with quantitative designs used in previous medical leadership program evaluations, where confidence and skill acquisition were modeled against participation metrics [13,14,15,17].

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Quality Assurance and Reliability

The questionnaire underwent pilot testing with five students from different programs to assess clarity, wording, and logical flow. Minor adjustments were made to improve item phrasing and response options. Cronbach's alpha coefficients were calculated to confirm internal consistency reliability, yielding acceptable values (α = .82 for confidence-related items).

Data integrity was maintained through duplicate screening for missing or inconsistent entries, with <5% missing data replaced using mean substitution for scale-based variables. The methodological rigor followed best practices in educational research, ensuring replicability and alignment with previous leadership education assessments [15,17,22].

Ethical Considerations

Ethical clearance was obtained from the university's Institutional Review Board (IRB) in accordance with the Declaration of Helsinki. Participation was voluntary, with no incentives or academic advantages offered. Data were anonymized at the point of collection, and confidentiality was maintained throughout analysis and reporting. Participants were informed that they could withdraw at any time without consequence.

Results

The sample included 30 participants who completed the survey, representing diverse academic backgrounds, with varying ages, majors, and years of study. The majority of respondents (80%) identified as current members of a university student club, 13.3% were not involved, and 6.7% had previously participated but were not currently active. About 40% of respondents reported holding a leadership position within a club, while 53.3% indicated they had not held such a role, and 6.7% had previously held a leadership position. This distribution provides insight into the range of student engagement in club activities and leadership roles.

The survey on student club participation highlights strong involvement and positive perceptions among respondents. Most (80%) are currently active in university clubs (CI [65.7%, 94.3%]), while 13.3% are not (CI [1.2%, 25.5%]), and 6.7% previously joined (CI [-2.3%, 15.6%]). Regarding leadership roles, 53.3% reported no prior positions (CI [35.5%, 71.2%]), with 40% having held a role (CI [22.5%, 57.5%]) and 6.7% indicating past leadership (CI [-2.3%, 15.6%]). Clubs are seen as essential for developing leadership skills, with 50% rating them as "Very important" (CI [32.1%, 67.9%]), 33.3% as "Important" (CI [16.5%, 50.2%]), and 16.7% as "Neutral" (CI [3.3%, 30.0%]). Notably, 73.3% believe clubs have greatly boosted their leadership confidence (CI [57.5%, 89.2%]), and 26.7% report moderate benefits (CI [10.8%, 42.5%]). Respondents expressed interest in leadership and management workshops and emphasized skill development in teamwork, communication, problem-solving, and networking through club involvement. Many desired additional club opportunities, particularly in leadership and management, affirming clubs as valuable environments for cultivating leadership qualities essential to future healthcare roles. These findings underscore student clubs' significant role in preparing healthcare professionals for leadership, evidenced by high response proportions and consistent confidence intervals across key areas.

Correlation Analysis

A Pearson correlation analysis (table 1), including effect size interpretations, was conducted to assess the relationships among club membership, leadership position, perceived importance of participation, and confidence as a future leader. The results indicated a significant positive correlation between club membership and both the perceived importance of participation ($r = 0.47$, $p = .009$) and confidence (r

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= 0.47, p = .009), with effect sizes classified as medium (Cohen, 1988). This suggests that active club members are more likely to view participation as valuable for leadership development and report higher confidence in their leadership potential, with club membership exerting a moderate influence on these outcomes.

Leadership position was not significantly correlated with club membership (r = -0.22, p = .242), perceived importance of participation (r = -0.12, p = .539), or confidence (r = 0.07, p = .711), with effect sizes for these associations classified as small. This finding suggests that holding a leadership role alone does not exert a strong influence on students' confidence or their valuation of club involvement. Similarly, the perceived importance of participation showed no significant association with confidence (r = -0.03, p = .869), with a small effect size, indicating a negligible impact.

Table 1: Correlation matrix of key variables

Variables	Club Membership	Leadership Position	Importance of Participation	Confidence
Club Membership	—			
Leadership Position	-0.22 (p = .242)	—		
Importance of Participation	0.47 (p = .009)	-0.12 (p = .539)	—	
Confidence	0.47 (p = .009)	0.07 (p = .711)	-0.03 (p = .869)	—

Note: Bold p-values indicate statistical significance at the 0.05 level.

Table 2: Regression table

Predictor	B	SE B	β	t	p
Constant	1.180	0.282	4.180	4.180	< .001
Club Membership	0.676	0.247	2.738	2.738	0.011
Leadership Position	0.168	0.161	1.045	1.045	0.306
Importance of Participation	-0.035	0.114	-0.309	-0.309	0.76

These findings underscore that active club membership, rather than isolated leadership roles or beliefs about the importance of participation, is more strongly associated with both students' confidence and their perceived value of club involvement for leadership development. The medium effect size associated with club membership highlights its meaningful impact on these key outcomes.

Multiple Regression Analysis

A multiple regression analysis (table 2) was conducted to determine whether club membership, leadership experience, and perceived importance of club participation significantly predict confidence as a future leader. The model was marginally significant overall, F(3,26)=2.93F(3,26)=2.93, p=.052p=.052, explaining 25.3% of the variance in confidence levels (R2=.253R2=.253), with an effect size indicating a medium effect (Cohen's $f^2 = 0.34$).

Of the three predictors, only club membership was statistically significant (B=0.68B=0.68, SEB=0.25SEB=0.25, β=2.74β=2.74, t(26)=2.74t(26)=2.74, p=.011p=.011), indicating that students who are currently members of a club reported significantly higher confidence levels. The effect size here was

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medium (r=.47r=.47), underscoring the meaningful impact of ongoing club participation on students' confidence in their leadership potential.

Leadership experience (B=0.17B=0.17, p=.306p=.306) and perceived importance of participation (B=−0.04B=−0.04, p=.760p=.760) were not statistically significant predictors. The effect sizes for these predictors were small, indicating minimal impact on confidence. These findings suggest that while holding a leadership role and valuing club participation may be related to leadership attitudes, they do not significantly influence confidence levels as much as active club membership does.

The results underscore the importance of active club participation in fostering confidence among students as future leaders. Correlation and regression analyses further reveal that regular club involvement is more strongly associated with confidence and perceived value of participation than isolated leadership experiences, with a medium effect size in predicting confidence. This implies that sustained engagement, rather than one-time leadership roles, may play a crucial role in building confidence and preparing students for future leadership in healthcare settings.

Discussion

This study examined how student-club participation relates to leadership development in health-professions students. Quantitatively, current club membership showed a moderate, significant association with both perceived importance of participation and confidence as a future leader ($r = .47$, $p = .009$), and in multiple regression it was the only significant predictor of confidence ($\beta = 2.74$, $p = .011$; $R^2 = .253$). In contrast, merely holding a leadership title and believing participation is important did not predict confidence. These results align with prior evidence that sustained, experiential engagement—rather than positional status—most strongly builds leadership capability and self-efficacy among learners [2,3,10,15,17,19].

Student organizations function as living laboratories where learners practice teamwork, communication, planning, and problem-solving—competencies our respondents repeatedly valued [2,21]. Consulting-style groups and project teams (e.g., real clients, deadlines, deliverables) create authentic, feedback-rich contexts that mirror clinical leadership demands; evaluations of such programs report gains in project management, communication, and professional identity [3,10]. The present finding—that membership (i.e., repeated participation over time) predicts confidence—echoes this literature, suggesting that frequency and continuity of hands-on engagement matter more than formal titles for leadership growth [15,17,19,21].

Systematic reviews of physician leadership programs show improvements in self-efficacy, communication, and team performance, while also noting the need for stronger evaluation designs and longer follow-up [15], [17]. At postgraduate levels, structured curricula for residents and surgeons similarly improve confidence and interpersonal competencies [13], [14]. Our results indicate that these benefits can be seeded earlier in training through accessible, extracurricular pathways—namely, sustained club participation that provides authentic practice and peer reinforcement. Service-learning and advocacy experiences further demonstrate that collaborative, community-oriented work fosters leadership identity and civic professionalism, consistent with students' emphasis on teamwork and communication in our data [20,27].

Beyond individual development, strengthening leadership capacity is linked to organizational

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performance and care quality. Commentaries and empirical analyses suggest that institutions with strong physician leadership can achieve better results by aligning clinical insight with strategic management [11], [12]. In this context, early and recurrent exposure to leadership practice through clubs is not peripheral enrichment; it is a foundation for later system-level impact.

From a social-cognitive perspective, confidence (self-efficacy) is built through mastery experiences, vicarious learning, and social persuasion. Club environments provide all three: students plan events, solve problems in teams, observe peers and mentors, and receive iterative feedback—conditions that plausibly underlie the moderate effect sizes we observed [15,19,21]. The null effects for leadership title suggest that symbolic authority without deep engagement may not deliver equivalent mastery experiences.

Students' reported gains (teamwork, communication, coordination, networking) map closely to the Medical Leadership Competency Framework (MLCF) domains—"Working with others," "Personal qualities," and elements of "Managing/Improving services" [25]. Prior student-run consulting programs have explicitly aligned activities with MLCF and noted perceived growth across these domains [10]. Our findings imply that routine club participation informally operationalizes MLCF competencies; adding structured reflection (journals, coaching, 360-feedback) could make these gains more explicit and assessable.

Using Kirkpatrick's model, the present study chiefly captures Level 2 (learning: confidence) and aspects of Level 3 (behavior: sustained engagement). Consistent with recommendations from reviews, future work should incorporate Level 4 (results) indicators—objective outcomes such as project deliverables, measurable improvements in society operations, or downstream leadership roles—to extend beyond self-report [15,17,26].

Commentaries and surveys argue that management and systems thinking should be core components of medical education, not optional extras [16,18,19,24]. Our findings support this stance: broad-based participation models(rotating roles, interprofessional teams, consulting projects) appear more impactful for confidence than exclusive executive titles. Embedding clubs within the curriculum via micro-credentials, reflective portfolios, or credit-bearing practicums would legitimize and scale access to these experiences [16,18,19,22,24].

Common barriers include time pressure, inconsistent mentorship, and resource constraints. Practical solutions—faculty liaisons, mentorship pipelines, micro-grants, protected time, recognition/awards—are emphasized in implementation guides and program reports [22,23]. These supports help convert ad-hoc enthusiasm into sustained ecosystems for student leadership development.

Because leadership capacity correlates with organizational outcomes at the institutional level [11,12], strengthening undergraduate leadership ecosystems is a strategic investment. Service-learning and advocacy programs show particular promise in cultivating collaborative and community-responsive leadership styles demanded in modern health systems [20,27].

Strengths, limitations, and future research

A strength of this study is the convergent pattern across correlation and regression: membership consistently predicts leadership confidence, aligning with experiential-learning theory and prior program evaluations [2,3,10,15,17,21]. Limitations include modest sample size (n = 30), cross-sectional design (no causal inference), and reliance on self-report—concerns mirrored in the

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broader literature [15,17]. Future research should (a) use multisite, longitudinaldesigns; (b) triangulate with peer/faculty ratings; (c) incorporate objective performance indicators (e.g., event quality metrics, sponsor implementation rates, simulation/OSCE leadership stations); and (d) test moderators (gender, prior experience, club type, mentorship access). Aligning outcomes to the MLCF and evaluating across all Kirkpatrick levelswill strengthen causal claims and practical relevance [25,26].

Conclusion

In a cohort of medical students, sustained club membership—not merely holding a formal title—was the most consistent predictor of leadership confidence. This aligns with evidence that experiential, longitudinal, mentored participation fosters leadership competencies and professional identity. Framed against system-level imperatives and the MLCF, student clubs are not extracurricular luxuries; they are core developmental arenas that can—and should—be intentionally supported and assessed to prepare tomorrow's clinician-leaders.

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