



The influence of a research community of practice on members' knowledge and skills, group identity, and self-efficacy moderated by videoconferencing technology

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Abstract. Community of practice is a form of professional learning and development activity. *Purpose.* This study aimed to explore the influence of community of practice activities, established based on the J. Lave and E. Wenger theory, on member's research knowledge and skills, group identity, and self-efficacy moderated by online videoconferencing technology. *Methodology.* The study adopted a descriptive, cross-sectional, quantitative research design; it used a pre-prepared survey to collect data from the community members and the SmartPLS software for data analysis and testing a structural equation model. *Findings.* The study revealed that community activities had a significant effect on research knowledge and skills ($t = 4.63, p < .001$), group identity ($t = 5.09, p < .001$), and self-efficacy ($t = 3.74, p < .001$). The video conferencing technology had an insignificant moderation effect on the relationship between community activities and research knowledge and skills ($t = 1.81, p = .070$), community activities and group identity ($t = 1.05, p = .293$), and the community of practice activities and self-efficacy ($t = 1.73, p = .084$). *Conclusion.* The communities of practice can enhance knowledge sharing and improve employee development and competence, specifically in complex domains, such as learning research and practice. *Value of the results.* The study disclosed a positive effect of the community of practice, guided by J. Lave and E. Wenger (1991) and S. M. Hord (1997), on sharing knowledge and experiences, improving skills, and enhancing collaboration among members.

Keywords: community of practice, research, group identity, self-efficacy, videoconferencing, nurses.

Introduction

In healthcare, research is critical for professional and organizational development and the quality of healthcare services. Research productivity among healthcare professionals, particularly nurses, the largest healthcare profession, is low for several reasons, including a lack of research knowledge and skills (RKS) among nurses and organizational support. Nursing efforts and research were limited to identifying the challenges of developing nursing research and evidence-based practice without proposing creative solutions and actions to enhance research learning and productivity.

According to social learning theories, a community of practice (CoP) is an effective platform for enhancing employee development and organizational learning. CoPs develop strategic capabilities

in organizations, create a link between learning and performance as the same people participate in CoPs and business units, and enhance business performance, effectiveness, and profitability (Wenger, Wenger-Trayner, 2015; Lesser, Storck, 2001).

Although the CoP is a creative idea with theoretical evidence for its role in enhancing the social interaction among members, knowledge sharing, knowledge creation, and identity building (Li et al., 2009), its utilization by professionals and organizations is not common and its effectiveness of remained unclear, particularly in the healthcare context (Li et al., 2009a). In addition, an effective CoP should design activities that encourage full participation from its members (Wenger et al., 2002). Engaging actively in CoP activities fosters opportunities for social interaction, knowledge sharing, knowledge creation, and identity building among members (Li et al., 2009a). This approach can serve as a tool to enhance clinical practices and support the implementation of evidence-based practices (Ranmuthugala et al., 2011). Furthermore, it plays a role in shaping the identities of its members (Wenger, 1998) and promotes both autonomous and controlled motivation for learning and performance (Deci and Ryan, 2015). Nevertheless, the literature lacks quantitative evidence for the effects of the CoPs on members (Li et al., 2009a), including competence, identity, and efficacy, particularly in complex domains such as research.

To bridge this gap in research production in healthcare, a group of nurses from several facilities of a large health service company in Abu Dhabi, UAE, sharing a passion for research, utilized the concept of CoP to establish the first one in January 2023 (Al Amiri, Al Qawasmeh, 2025). The new nursing research CoP, guided by the situated learning theory and legitimate peripheral participation (Wenger, Lave, 1991), serves as a platform for learning and sharing among nurses and increases research production. The CoP used online networking technology, which evolved rapidly in the Industry 4.0 (I4.0) era, particularly after the COVID-19 pandemic in 2020; it utilized the new communication technology to enhance collaboration among a broader network of nurses to accomplish more as a group than individuals do (Al Amiri, Al Qawasmeh, 2025).

Accordingly, this study, based on an extensive literature review, proposed and tested a theoretical model for the effect of the CoP activities on RKS of members, group identity (GI), and self-efficacy (SE) moderated by videoconferencing technology (VCT). The study answered questions, including "Do the CoP activities affect the RKS, GI, and SE of members?" and "Does the online VCT moderate the relationships between the CoP activities and RKS, GI, and SE of members?" The study adopted a descriptive, cross-sectional, quantitative research design and used a pre-prepared survey to collect data from the CoP members in January and February 2024.

The study is one of few studies that provided quantitative evidence for the effect of virtual CoPs as a professional development platform for developing knowledge and skills, GI, and SE of individuals in high technical domains, such as research in highly evolving contexts. In addition, the study also adopted the concept of digital collaboration, which refers to using technology to connect a broader network of participants. This adaptation became essential in the healthcare sector following the COVID-19 pandemic (Channi et al., 2022). This approach enables individuals to achieve more, as the virtual environment provides tools and resources that are often impractical in face-to-face meetings (Taylor et al., 2020). The evidence could encourage others to adopt virtual CoP as a primary collective learning and professional development.

Literature review

Social learning theories

L. S. Vygotsky assumed that the mental nature of humans represents the totality of social relations internalized and transformed into individual functions, and shapes their structure

(Vygotsky, 1981). Furthermore, A. Bandura argued that the social learning theory assumes modeling influences learning by providing observers with information and symbolic representations of modeled activities rather than specific stimulus-response associations (Bandura, 1977a). Moreover, J. Lave and E. Wenger introduced the situated learning theory, which claims that learning is a process that occurs in a participation framework, i.e., CoP, where several active members participate rather than individual minds (Lave, Wenger, 1991). Thus, social learning is enhanced by community interaction with network processes. Nevertheless, the network, which refers to the relationships, personal interactions, and connections among participants, has the danger of noise and diffusion that increase as connectivity increases.

Definition, structure, and activities of communities of practice

E. Wenger defined CoPs as groups of people who share a concern or passion for something they do and learn how to do it better through regular interaction (Wenger, 2004). Furthermore, the World Bank Group defines CoPs as groups of people who share interests in a specific area and coordinate efforts to achieve particular goals by crossing organizational boundaries to relate to one another, collaborating to exchange information, learning together, improving their skills, and advancing the general knowledge of the area (World Bank Group, 2021). Furthermore, J. Lave and E. Wenger proposed the concept of legitimate peripheral participation, which asserts that new members start participating in simple, peripheral activities of the community and observing experts until they become confident and familiar with the principles of the community then they evaluate their contribution to the community (Lave, Wenger, 1991). CoPs were initially developed as a learning theory that promotes self-empowerment and professional development and then as a tool for improving organizational competitiveness (Li et al., 2009b).

CoPs are self-organizing systems, based on the voluntary engagement of members. They include three structural dimensions: (1) the discipline, which defines the community identity; (2) the community, which refers to the relationships of mutual engagement that bind members together into a social entity; and (3) the practice, which refers to the capability that members developed over time (Snyder, Wenger, 2010; Wenger, 1998; 2000). S. M. Hord described five characteristics of professional communities (Hord, 1997). First, supportive and shared leadership that removes hierarchy and emphasizes democratic styles. Second, collective learning or learning together. Third, shared values and vision by involving members in developing and utilizing the vision in decision-making. Fourth, supportive conditions include the time, the place, and the process of the meetings. Fifth, shared personal practice that included observing, discussing, and reviewing peer practices.

On the other hand, E. Wenger with colleagues claimed that a good community should design activities that allow participants at all levels to feel like full members (Wenger et al., 2002). Furthermore, the technical and operational performance support (TOPS) Program suggested numerous activities for stimulating knowledge sharing and learning, e.g., participatory meetings to ensure people engagement and productivity, games activities, webinars, posters, mentoring and coaching, knowledge sharing awards, and after-action review to improve future events and activities by capturing lessons learned and new ideas (The TOPS Program, 2017).

Effects of communities of practice

According to E. Wenger, CoPs act as nodes for information exchange and interpretation, retaining knowledge, stewarding competencies, and providing homes for identities (Wenger, 1998). Researchers identified four characteristics of CoP, including social interaction among members, knowledge sharing, knowledge creation, and identity building (Li et al., 2009a). E. Wenger claimed that shared practice creates new boundaries critical for connecting communities when experience and competence are in close tension resulting from interaction, engagement, and commitment about

something (Wenger, 2010). The initial focus of CoPs was on learning and exchanging information and knowledge, and later was used as a tool to improve clinical practice and facilitate the implementation of evidence-based practice (Ranmuthugala et al., 2011). CoPs and networks are complementary because being interconnected increases the sense of community, and the desire to learn about a shared concern motivates people to seek connections (Wenger et al., 2011).

Participation is extended from being engaged in CoP activities to being an active participant where we become who we are (build our identity) by playing a part in the relations of engagement that constitute our community, engaging in particular actions, and valuing specific experiences (Wenger, 1998). In other words, identity is a lived experience of participation in a community presented in the form of competence. Members of a CoP obtain enriched learning and higher motivation to apply what they learned, and the social capital leads to behavioral change in the form of higher knowledge sharing (Lesser, Storck, 2001). Social contexts and individual differences facilitate autonomous and controlled motivation for learning and performance (Deci, Ryan, 2015). In addition, N. Al Amiri and K. Al Qawasmeh provided empirical evidence confirming that SE plays a critical role in individual research productivity (Al Amiri, Al Qawasmeh, 2021).

Online communities of practice

E. Wenger with colleagues, in their book “Digital Habitats: Stewarding Technology for Communities,” claimed that new information and communication technology (ICT) will continue to emerge and will be used to support all aspects of teaching, learning, and schooling (Wenger et al., 2009). Scholars revealed that communication technology, including VCT, positively influenced student engagement, quality of education, and its efficiency (Basko, Hartman, 2017; Alshahrani et al., 2020; Gladović et al., 2020). In addition, students expressed positive views about their experience with distance education during the COVID-19 pandemic (Altwaijry et al., 2021).

S. Barnett with colleagues highlighted the usefulness of virtual CoP for general practitioner training, e.g., reducing isolation, improving the connectedness of the general practitioners, and building trust among them (Barnett et al., 2014). However, the study emphasized that the chat function was limited, and training can overcome barriers, such as time and technology. On the other hand, online and blended learning research, which employs the CoP theory, should move beyond traditional theory verification to provide an understanding of online and blended learning environments (Smith et al., 2017).

It was revealed in a qualitative study of teachers who participated in online CoPs that teacher’s general identity partly influenced their ways and levels of participation in online CoPs (Khalid, 2018). She also discovered several factors that lead to participation, including beliefs in the benefits, importance, and role in the online community, desire to initiate discussions and respond, and acceptance of others’ comments. However, it was found that different individuals had different sharing preferences driven by how they conceived of professional development and perceived themselves professionally (Khalid, 2018). Furthermore, S. L. Sibbald with colleagues disclosed several benefits of a virtual CoP that connected healthcare professionals from across Canada committed to improving healthcare policy and practice, including making connections, accessing resources, developing a sense, and facilitating knowledge exchange (Sibbald et al., 2022).

Theoretical framework and hypothesis

The study integrated several social learning theories, including social learning theory, the situated learning theory, and the legitimate peripheral participation concept, emphasizing that learning occurs through active interaction, participation, and practices of members (Bandura, 1977a; Lave, Wenger, 1991). The situated learning theory claims that learning occurs in a participation framework, i.e., CoP,

where several active members participate, and legitimate peripheral participation asserts that new members start participating in simple, peripheral activities of the community and observing experts until they become confident and familiar with the principles of the community (Lave, Wenger, 1991). Then, they evaluate their contribution to the community.

The literature identified several fundamental attributes for professional learning and practice communities, i.e., supportive and shared leadership, collective learning, shared values and vision, supportive conditions, and shared personal practice (Hord, 1997). CoPs act as a platform for information exchange and interpretation, knowledge sharing, retaining, and knowledge creation, and stewarding competencies (Li et al., 2009a; Wenger, 1998). Accordingly, the author proposes hypothesis 1 as follows (Fig. 1).

H1: The research community of practice activities influence the research knowledge and skills of its members.

K. B. Henry with colleagues also defined GI as the identification of members with an interacting group (Henry et al., 1999). Having identity leads to actions and behavior, i.e., adding a specific meaning and value for a particular action according to the actor's identity and providing appropriate roles that actors perform (Abdelal et al., 2001). The CoP is the context where individuals develop practice and identity and become who they are (build their identity) by playing a part in the relations of engagement that constitute our community, engaging in particular actions, and valuing specific experiences (Wenger, 1998). Social interaction among members and identity building are identified as key characteristics of CoPs (Li et al., 2009a). Accordingly, the author proposes hypothesis 2 as follows (Fig. 1).

H2: The research community of practice activities influence the group identity of its members.

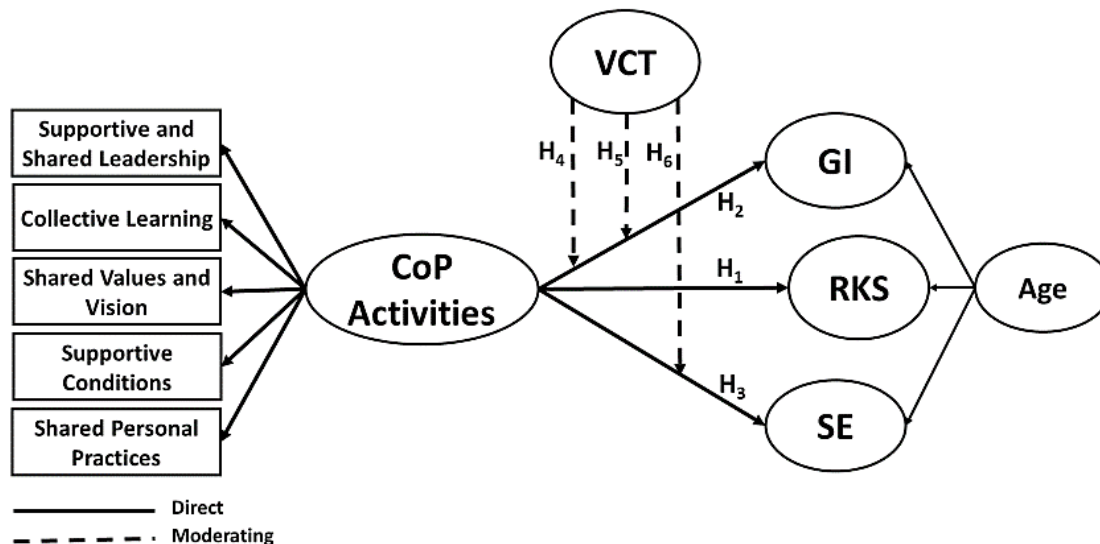


Figure 1. A proposed model for the influence of the community of practice on research knowledge and skills, group identity, and self-efficacy moderated by videoconferencing technology

SE is defined as “people’s beliefs about their capabilities to produce designated levels of performance that exercise their influence over events by affecting people’s cognitive, motivational, affective, and selection processes” (Bandura, 1994; 1977b). The CoP members obtain higher motivation to apply what they learn, and the social capital leads to behavioral change in the form of higher knowledge sharing, and CoPs promote self-empowerment and professionalism (Lesser,

Storck, 2001; Li et al., 2009b). In addition, empirical evidence has confirmed that SE is a predictor for individual research productivity (Al Amiri, Al Qawasmeh, 2021). Accordingly, the author proposes hypothesis 3 as follows (Fig. 1).

H3: The research community of practice activities influence the self-efficacy of its members.

On the other hand, the new ICT could support all aspects of teaching, learning, and schooling (Wenger et al., 2009). Several scholars also revealed several advantages of online CoPs (Khalid, 2018; Barnett et al., 2014). Other scholars provided empirical evidence for the positive impact of communication technology, including video conferencing, on education and learner satisfaction (Alshahrani et al., 2020; Altwaijry et al., 2021; Basko, Hartman, 2017; Gladović et al., 2020). Accordingly, the author proposes hypotheses 4, 5, and 6 as follows (Fig. 1).

H4: The online videoconferencing technology moderates the relationship between the community of practice activities and the research knowledge and skills of members.

H5: The online videoconferencing technology moderates the relationship between the community of practice activities and the group identity of members.

H6: The online videoconferencing technology moderates the relationship between the community of practice activities and the self-efficacy of members.

Methodology

The study utilized a descriptive, cross-sectional, quantitative research design to investigate the impact of virtual research CoP activities and practices on the research knowledge sharing of members. The quantitative research design aims to test hypotheses, including relationships between independent and dependent variables, and analyses data using statistics (Mohajan, 2020). The study population consists of 57 nurses who were members of a research community of practice established earlier in 2023. The members were from various facilities of Abu Dhabi Health Services Company (SEHA), the primary healthcare service provider in Abu Dhabi, UAE.

The minimum required sample size for this study was calculated using G*Power for given α , the effect size at 0.15 (medium effect), α at 0.05, and power at 0.80 in the input parameters as those are the commonly recommended setting for social and business science research and one predictor (Hair et al., 2017). In this study, the authors employed a total sampling technique, selecting the entire CoP population, resulting in a sample size of 55. This approach achieved the highest possible response rate given the limited population size of the nursing research CoP. The authors also used SmartPLS 4.0 software, which is sensitive and frequently used to analyze data in small samples, such as studies conducted among limited populations.

The survey consisted of six parts assembled to collect data. The first part collected demographic data about respondents, including gender, age, education, and years of experience. The second part included three reflective items prepared by the author about members' level of participation and 20 reflective items to collect information about the level of support and shared leadership, shared values and vision, the collective learning and collaboration, shared personal practice, and structural or social supports (Olivier, Hipp, 2010; Hipp, Huffman, 2003). The third part included four reflective items adapted from A. D. Lund to collect information about the usability of online networking technology, i.e., usefulness, ease of use, ease of learning, and user satisfaction (Lund, 2001). The fourth part included four reflective items adapted from K. B. Henry with colleagues to collect information about member's GI, i.e., cognitive source, affective source, and behavioral source (Henry et al., 1999). The fifth part included three reflective items adapted from A. S. Gaumer Erickson and P. M. Noonan to collect information about members' SE, i.e., their belief in personal ability and that ability grows with effort (Gaumer Erickson, Noonan, 2018). The sixth part included eight reflective items to collect

information about member's RKS (Al Amiri, Al Qawasmeh, 2021; Prahmana, 2017; 2015). The RKS items included formulating the research question, finding necessary relevant information, deciding on the appropriate research method to solve the research problem, making a research design, constructing the research instrument to collect data, deciding sampling techniques, organizing and describing the collected research data, analyzing research data, interpreting, concluding (Appendix A). The author utilized a 5-point Likert scale consisting of strongly disagree, disagree, neutral, agree, and strongly agree for all items.

The SEHA Research Ethics Committee reviewed and approved the study (Ref. No.: SEHA-IRB-039), and the author adhered to the ethical research standards. The access link to the survey was sent to all members via the CoP's WhatsApp group in January and February 2024.

Results

The final analysis included 40 responses out of 55 surveys emailed to participants, a nearly 70% response rate. The demographic data analysis indicated that the responders belonged to different healthcare facilities of SEHA and represented various ages, genders, education levels, experiences, and positions (Table 1).

Table 1. Demographic profile of the respondents

Category	Subcategories	Frequency	Percentage
Facility	Tawam hospital	8	20%
	Al Dhafra hospitals	7	17.5%
	Al Corniche hospital	3	7.5%
	SEHA Kidney Care	0	0
	Ambulatory health services	0	0
	Sheikh Khalifa medical city (SKMC)	13	32.5%
	Al Rahba Hospital	1	2.5%
	Sheikh Shakhboub Medical City	8	20%
Gender	Male	5	12.5%
	Female	35	87.5%
Age (in years)	24–30	1	2.5%
	31–45	28	70%
	46–60	11	27.5%
	Above 60	0	0
Education	Diploma	0	0
	Bachelor	13	32.5%
	Master	26	65%
	Ph.D.	1	2.5%
Position	Staff nurse	17	42.5%
	Charge nurse	3	7.5%
	Unit manager	1	2.5%
	CRN	17	42.5%
	Others	2	5.0%
Work experience (in years)	1–5	1	2.5%
	6–10	1	2.5%
	11–15	17	42.5%
	16–20	8	20.0%
	21–25	9	22.5%
	More than 25	4	10.0%
Total		40	100%

First, the author employed the PLS algorithm for analyzing both the measurement and structural models. Next, they used the PLS algorithm to assess indicator reliability, internal consistency, convergence validity, and discriminant validity.

The factor loading results for all items were acceptable as they were higher than 0.7 (Table 2). Thus, all concerned measurements were accepted. The results of the construct reliability, including both composite reliability (CR) and Cronbach's alpha (α), passed the internal reliability test as they were higher than 0.70 (Table 2). Moreover, the results of convergent validity, specifically the Average Variance Extracted (AVE), were accepted as they exceeded 0.5 (Table 2).

Table 2. Evaluation criteria for reflective measures

Construct	Dimensions	Item	<i>M</i>	<i>SD</i>	FL	AVE	CR	α
Community of practice activities	Supportive and shared leadership	1	4.4	.7	.87	.64	.95	.95
		2	4.3	.7	.92			
	Shared values and vision	3	4.3	.7	.95			
		4	4.3	.7	.95			
	Collective learning and collaboration	5	4.3	.8	.9			
		6	4.5	.7	.98			
	Shared personal practice	7	4.2	.9	.87			
		8	4.3	.9	.93			
	Structural or social supports	9	4.4	.7	.94			
		10	4.4	.7	.76			
Videoconferencing technology	Usefulness	11	4.2	.9	.84	.82	.95	.95
		12	4.4	.8	.88			
		13	4.3	.9	.96			
		14	4.3	.9	.95			
Group identity	Member's satisfaction	15	4.3	.9	.93	.74	.89	.89
		16	4.3	.8	.86			
		17	4.4	.7	.72			
		18	4.3	.8	.98			
Self-efficacy	Cognitive	19	4.3	.7	.83	.68	.89	.89
		20	4.4	.6	.71			
	The belief that ability grows with effort	21	4.4	.6	.82			
		22	4.5	.6	.87			
Research knowledge and skills	Behavioral	23	4.2	.6	.97	.80	.97	.97
		24	4.2	.6	.95			
		25	4.2	.7	.89			
		26	4.1	.7	.90			
		27	4.1	.7	.83			
		28	4.1	.8	.862			
		29	4.1	.8	.916			
		30	4.1	.8	.846			

The Heterotrait–Monotrait ratio (HTMT) was recommended to measure the discriminant validity (Henseler et al., 2015). All HTMT values were less than 0.85 (Table 3). However, it is worth mentioning that several reflective items were deleted from multiple exogenous constructs to reach HTMT values less than 0.85, which reflected an actual distinctiveness of one variable from another. The deletion of those items did not affect the validity of the survey, as they were reflective items, not formative, which means that other existing items covered the scope of the constructs.

The variance inflation factor (VIF) values were 2.784 between CoP activities and RKS, 1.761 between CoP activities and GI, 1.761 between CoP activities and SE, and 2.784 between VCT and RKS, 2.081 between the VCT and GI, and 2.081 between VCT and SE. The results emphasized that the

multicollinearity among the independent constructs was not a problem as the values were within the normal range, i.e., less than 3.

Table 3. Results of Heterotrait–Monotrait ratio

No	Variable	1	2	3	4	5	6	7	8	9
1	Collective learning									
2	Group identity	.523								
3	Research knowledge and skills	.412	.592							
4	Self-efficacy	.549	.780	.734						
5	Shared practice	.722	.566	.201	.437					
6	Vision and values	.829	.735	.477	.570	.774				
7	Structure and support	.603	.632	.446	.439	.800	.718			
8	Leadership	.753	.404	.585	.485	.643	.796	.626		
9	Videoconferencing technology	.600	.390	.566	.572	.504	.535	.591	.557	

The reflective measurement analysis exhibits satisfactory levels of reliability and validity. Thus, the authors proceeded with assessing the structural model. The coefficient of determination (R^2) values that present the variance explained by the endogenous constructs were substantial before introducing the moderator for all endogenous constructs, i.e., 0.253 for RKS, 0.466 for GI, and 0.329 for SE based on criteria, i.e., substantial > 0.25; moderate: 0.13 to 0.25; weak: 0.02 to 0.12 (Cohen, 1988). On the other hand, the analysis revealed that the effect sizes (f^2) of CoP activities before introducing the moderator were 0.336 (medium) on RKS, 0.847 (large) on GI, and 0.489 (medium) on SE based on J. Cohen's criteria of the f^2 of ≥ 0.02 (small), ≥ 0.15 (medium), and ≥ 0.35 (large) (Cohen, 1988).

The analysis included the test of goodness of fit (GoF), which determines the overall measure of model fit for PLS-SEM. The standardized root means square residual (SRMR) was used to estimate the goodness of fit (GoF). The SRMR value was 0.088 for the saturated model. In contrast, other fit indices such as d_G , Chi-square, and NFI could not be calculated using SmartPLS in higher-order models, as repeated indicators were used twice, and correlated perfectly with itself in the correlation matrix (Ringle et al., 2024). The values were accepted because the normal range for the SRMR index is less than 1 (Schermelleh-Engel et al., 2003) and close to 0.08, which is the conservative cut-off recommended by Hu and Bentler (1999).

In addition, the analysis of the predictive relevance (Q^2 value) of the endogenous constructs, without moderation, showed that the resulting cross-validated redundancy Q^2 values were above zero for all endogenous constructs, i.e., 0.126 for RKS, 0.291 for GI, and 0.164 for SE, and 0.190 for RKS providing support for the model's predictive accuracy (Chin, 2010). Then, the author compared the mean absolute error (MAE) values, not the root-mean-square error (RMSE), with the naïve linear regression model (LM) benchmarks as the evaluated prediction error distribution is highly non-symmetric, as evidenced by a long left or right tail (Hair et al., 2021). The comparison results disclosed that the majority of indicators in the PLS-SEM analysis had lower MAE values compared to the naïve LM benchmark, reflecting that the model had medium predictive power.

The path coefficient was calculated using the bootstrapping procedure, which estimated t-values, confidence intervals, and the relationship in the inner path model through the regression coefficient (β). The model was tested in two steps: first, without moderation, and second, with the introduction of the moderation construct (Hair et al., 2021).

The model included a control variable, the participant's age, to ensure that the results were solely attributable to the independent variables. The effect of age was insignificant ($p > 0.05$) on RKS, GI, and SE. On the other hand, Table 4 presents the direct path coefficient assessment, which disclosed that the CoP activities positively affected members' RKS, GI, and SE. Thus, $H1$, $H2$, and $H3$ were supported.

Table 4. Direct path coefficient results (bootstrapping result without moderation)

Hypotheses	Std. β	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Decision
Age (31-45) -> Research knowledge and skills	-.158	-.154	.266	.597	.551	Insignificant
Age (31-45) -> Group identity	-.286	-.272	.339	.843	.400	Insignificant
Age (31-45) -> Self-efficacy	.029	.015	.365	.081	.936	Insignificant
H1 (Community of practice activities -> Research knowledge and skills)	.487	.506	.105	4.633	.000	Significant
H2 (Community of practice activities -> Group identity)	.629	.640	.123	5.091	.000	Significant
H3 (Community of practice activities -> Self-efficacy)	.532	.541	.142	3.737	.000	Significant

Note: * — $p < 0.05$

It is worth mentioning that the direct effect of CoP activities on RKS, GI, and SE are within a 95% confidence interval, i.e., [0.292; 0.626], [0.366; 0.837], and [0.231; 0.773], respectively. As those intervals do not include zero, they remain significant (Hair et al., 2021).

In step 2 of bootstrapping analysis, i.e., introducing the moderating construct, the moderating effects of VCT were insignificant on the relationships of CoP activities and RKS, CoP activities and SE, and CoP activities and GI at $p < 0.05$ (Table 5).

Table 5. Moderation results

Hypotheses	Std. β	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Decision
H4 (Videoconferencing technology x Community of practice activities -> RKS)	.325	.340	.179	1.814	.070	Insignificant
H5 (Videoconferencing technology x Community of practice activities -> GI)	.213	.229	.203	1.051	.293	Insignificant
H6 (Videoconferencing technology x Community of practice activities-> SE)	.369	.370	.214	1.726	.084	Insignificant

Note: $p < 0.05$.

Although the results did not support the moderation effects of the VCT, it is worth highlighting that the means of the VCT scale were high (4.3–4.4 out of 5) for the VCT usefulness, ease of use, ease of learning, and member satisfaction, which reflects a significant value of the VCT.

Discussion

This study aimed to examine the effect of CoP activities on RKS, GI, and SE of members moderated by online videoconferencing technology. The CoP was established based on social learning theory, learning situated theory, and legitimate peripheral participation (LPP) to enhance RKS among nurses in several healthcare facilities of SEHA (Bandura, 1977a; Lave, Wenger, 1991).

The sample size for this study was relatively small, but it was deemed acceptable for two main reasons. First, the population size of the nursing research CoP was small due to the reality that CoPs are uncommon in the Middle East context, and this CoP was the first one established to enhance and practice research, particularly among nurses, which justified the small sample size. Second, the sample size exceeded 30 participants, which was sufficient for initiating a quantitative analysis using SmartPLS software, a sensitive statistical software that can effectively handle smaller sample sizes. However, the required minimum sample calculated using G*Power was 55, close to the obtained sample size of 40.

The reliability and validity of the study instrument (Appendix A) included acceptable factor loadings of the measurements, CR, α , AVE, HTMT, and VIF values, reflecting indicator reliability, internal consistency, convergence validity, and discriminant validity. Conversely, the analysis revealed significant R^2 values for all endogenous constructs, and the f^2 values of CoP activities were medium to large for the endogenous constructs. Moreover, the model had an acceptable GoF value and medium predictive power.

The first step of the path model assessment revealed that the CoP is a place for active learning, including interaction and practices of members (Lave, Wenger, 1991). The five components of the professional learning and practice communities, i.e., supportive and shared leadership, collective learning, shared values and vision, supportive conditions, and shared personal practice (Hord, 1997), also had a positive, significant effect on RKS, GI, and SE. In more detail, the positive influence of the CoP activities on RKS is aligned with the claim that learning occurs through active interaction, participation, and practices of members, facilitates learning, information and knowledge exchange and interpretation (Lave, Wenger, 1991; Wenger, 1998; Lesser, Storck, 2001; Ranmuthugala et al., 2011). The results also supported the author's claim that the effect of CoP activities on complex domains, specifically learning RKS, could be more significant than individual learning.

On the other hand, the results supported the assertion that CoPs foster identities, facilitating the transition of members from engaging in activities to becoming active participants (Wenger, 1998). Moreover, the results enforced that the CoP activities positively influenced the SE regarding members' beliefs about their capabilities to produce designated performance and exercise their influence over events. The results were aligned with claim that CoP members obtain higher motivation to apply what they learn, and social capital leads to behavioral change in the form of higher knowledge sharing (Lesser, Storck's, 2001). The findings were also aligned with L. C. Li with colleagues claim that CoPs promote self-empowerment and professionalism (Li et al., 2009b). However, the author argues that the effect of the CoP activities could be stronger on RKS, GI, and SE of members after a longer time, i.e., two to three years of implementation.

The second step of the path model analysis includes introducing the VCT as a moderator. The result disclosed that the VCT had an insignificant effect on the relationship between CoP activities and RKS, GI, and SE. In other words, using VCT could have a similar influence as face-to-face meetings. This result contradicts the claim of many scholars about the advantage of ICT in supporting all aspects of teaching and learners satisfaction (Wenger et al., 2009; Barnett et al., 2014; Basko, Hartman, 2017; Khalid, 2018; Alshahrani et al., 2020; Gladović et al., 2020; Altwaijry et al., 2021). These results may be due to the limitations of the VCT scale, which only included factors such as usefulness, ease of use, ease of learning, and member satisfaction. The survey did not include items related to geographical distance and time that were considered benefits of the VCT.

Although the study did not support the effect of VCT, this technology remains an effective method for professional and organizational learning due to its usefulness, ease of use, ease of learning, member satisfaction, and low cost. VCT also overcomes several challenges, including geographical distance and time constraints. It also supports establishing a broad professional collaboration network within large organizations or between organizations. Moreover, it serves as an effective educational platform during specific situations, such as extreme weather conditions and health outbreaks like the COVID-19 pandemic. However, members encountered occasional challenges with the VCT, such as poor audio and visual quality, network latency, and user errors, which affected their experiences (Al Amiri, Al Qawasmeh, 2025).

Limitations

The study had several limitations. First, the sample size was small, consisting of only 57 members, which may have impacted the effects of the Community of Practice (CoP) activities on the dependent variables. Although 40 respondents participated, exceeding the minimum requirement of 30 for a quantitative analysis, the sample was drawn from a single CoP. This limited sample size may restrict the generalizability of the findings, highlighting the need for future research to include larger samples from multiple CoPs.

Additionally, the study utilized a cross-sectional research design, which meant data collection occurred at only a single point in time. It would be beneficial to repeat the survey after one or two years to better understand the relationships over a longer period.

Conclusion

The study highlighted the positive influence of CoP, as guided by some researchers (Lave, Wenger, 1991; Hord, 1997). The CoPs can serve as an effective platform to enhance knowledge sharing and improve employee development and competence, specifically in complex domains, such as learning research and practice. Organizations should actively support the establishment and sustainability of CoPs to enhance innovation and competitiveness.

However, some challenges arose from this study regarding the insignificant moderating effect of the VCT. However, this challenge should be wisely handled, considering the usefulness, ease of use, ease of learning, and member satisfaction of the VCT and its advantages in crossing organizational and geographical boundaries.

Recommendations

The author recommends using the CoP framework for nurses' learning in other fields that require complex knowledge and skills, such as wound care. It could also be utilized by other healthcare practitioners, and in various sectors and fields. The CoP leadership should consider online technology to cross organizational and geographical boundaries. The CoP leaders should employ an enhanced VCT scale that incorporates items assessing the benefits of VCT in bridging geographical distances among members. The leaders should also identify appropriate solutions for the effective utilization of VCT. For better utilization of the VCT, the authors recommend establishing guidelines for members, such as switching on cameras and participation by all.

On the other hand, the author believes that CoP members require a longer time for research learning and practice to grasp a higher level of SE, GI, and RKS, as research is a broad and complex domain. Accordingly, the author suggests reassessing the outcome after a long period, for example, two to three years.

Future quantitative research could examine the individual effect of the five components of CoP practices, including supportive and shared leadership, collective learning, shared values and vision, supportive conditions, and shared personal practice, on research learning and practices (Hord, 1997).

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Declarations

Conflict of interest. The author declares no conflict of interest.

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Appendix A

The survey

- 1) The community members are involved in discussing and making decisions about most issues.
- 2) The community members have access to essential information.
- 3) The community members participate in developing the vision statement.
- 4) The community members share visions for improvement that focus on member's learning.
- 5) The community members collaboratively analyze peer's work to improve learning.
- 6) The community members have opportunities and structures for collective learning through open dialogue.
- 7) The community members have opportunities for observing peers and offering encouragement.
- 8) The community members have opportunities for coaching and mentoring.
- 9) Appropriate technology and instructional materials are available to the community members.
- 10) The community members are recognized for outstanding achievements.
- 11) The community members get adequate time to meet and discuss issues.
- 12) I found that using videoconferencing technology saves my time.
- 13) I used the videoconferencing technology successfully every time.
- 14) It was easy for me to learn how to use the videoconferencing technology.
- 15) I was satisfied with the videoconferencing technology.
- 16) I think of this community as part of who I am.
- 17) I enjoy interacting with the members of this community.
- 18) I contribute to achieving the community's goals.
- 19) I am confident that I will achieve the goals that I set for myself.
- 20) I can figure out anything if I try hard enough.
- 21) I can change my basic level of ability considerably.
- 22) I believe that my ability grows with effort.
- 23) I am more familiar with the research process and steps than before.
- 24) I am more familiar with searching for relevant literature for my research than before.
- 25) I am more familiar with research designs than before.
- 26) I am more familiar with sample types than before.
- 27) I am more familiar with data collection methods than before.
- 28) I am more familiar with data analysis procedures than before.
- 29) I am more familiar with interpreting data and drawing conclusions than before.
- 30) I am more familiar with research weaknesses and limitations than before.

Влияние исследовательского сообщества практиков на знания и навыки его членов, групповую идентичность и самооффективность, опосредованное технологией видеоконференций

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Больница Тавам, Аль-Айн, Объединённые Арабские Эмираты

Аннотация. Сообщество практиков (*community of practice*) — это форма профессионального обучения и развития. *Цель.* Целью данного исследования было изучение влияния деятельности сообщества практиков, созданного на основе теории Дж. Лаве и Э. Венгера, на исследовательские знания и навыки его членов, групповую идентичность и самооффективность, модулируемое технологией онлайн-видеоконференций. *Методология.* В исследовании использовался описательный, поперечный, количественный дизайн; для сбора данных на выборке членов сообщества использовался заранее подготовленный опросник, а для анализа данных и проверки модели структурных уравнений — программное обеспечение SmartPLS. *Результаты.* Исследование показало, что деятельность сообщества оказала значительное влияние на исследовательские знания и навыки ($t = 4,63, p < 0,001$), групповую идентичность ($t = 5,09, p < 0,001$) и самооффективность ($t = 3,74, p < 0,001$). Технология видеоконференций оказала незначительное модулирующее влияние на взаимосвязь между деятельностью сообщества и исследовательскими знаниями и навыками ($t = 1,81, p = 0,070$), деятельностью сообщества и групповой идентичностью ($t = 1,05, p = 0,293$), а также деятельностью сообщества практиков и самооффективностью ($t = 1,73, p = 0,084$). *Вывод.* Сообщества практиков могут способствовать обмену знаниями и улучшению развития и компетентности сотрудников, особенно в сложных областях, таких как обучение исследованиям и практике. *Ценность результатов.* Исследование выявило положительное влияние сообщества практиков, разработанного Дж. Лаве и Э. Венгером (1991) и С. М. Хордом (1997), на обмен знаниями и опытом, совершенствование навыков и повышение уровня сотрудничества между членами сообщества.

Ключевые слова: сообщество практиков, исследование, групповая идентичность, самооффективность, видеоконференции, междисциплинарность.