

Collaboration in Early Childhood Intervention Services

Professional Perspectives

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Abstract

Collaboration is a sophisticated activity requiring knowledge, technical competencies, and interpersonal skills. Many professionals lack experience in collaboration and therefore face challenges in forming and sustaining early childhood intervention (ECI) teams. There is a paucity of research on collaboration within ECI teams, especially within healthcare settings in resource-constrained nations marked by linguistic and cultural diversity, such as South Africa. Participants included 34 professionals who completed a survey. The results revealed that professionals possess a good understanding of collaboration and perceive families to be integral members of the team. Professionals emphasized the importance of resources, efficient communication, mutual respect, and the sharing of information. These results are discussed, with the limitations of the study, as well as future recommendations, outlined.

Keywords: Professional perceptions; early intervention teams; collaboration in early intervention; transdisciplinary; resource-limited; survey

In South Africa, approximately 83% of the population relies on the public healthcare sector (Ngobeni et al., 2020), which includes children aged 0-6 years who are eligible for free healthcare under the National Health Act of 2003. Early Childhood Intervention (ECI) primarily serves children at risk for developmental delays and those with disabilities, estimated at 2.1 million, constituting 11.2% of the child population. Notably, 28% are aged 0-4 years, and 10% are aged 5-9 years (UNICEF, 2012). Effective collaboration is paramount for ECI teams in addressing the diverse needs of these children and their families (Dinnebeil et al., 1996; Maluleke et al., 2023; Bricker et al., 2022).

Collaboration in teams does not develop in a vacuum but is influenced by and influences the various systems in which the team is embedded (Samuels et al., 2020; Bricker et al., 2022). Thus, processes of collaboration will vary in different ECI contexts and will depend on political contexts, societal commitment, the nature of problems exhibited by the child and its family (Guralnick, 2008), resources available (Guralnick, 2008; Barratt et al., 2012), as well as professionals' competency in working with caregivers from diverse backgrounds (Pillay et al., 2020; Khoza-Shangase & Mophosho, 2018).

Successful ECI teams require collaboration among diverse professionals, including nurses, physiotherapists, occupational therapists, social workers, doctors, speech-language therapists, together with families (Rausch et al., 2021; Bricker et al., 2022). Early childhood professionals assume a pivotal role in promptly identifying developmental delays, while also shaping young children's early learning outcomes (South African Department of Social Development [DoSD], 2015; Bruder, 2010). These early learning outcomes are intricately linked to school readiness and have the potential to substantially enhance later educational achievements, particularly for at-risk children from resource-challenged backgrounds who face developmental delays (Abdoola et al., 2019; Slemming & Saloojee, 2013; DoSD, 2015).

Moreover the collaborative nature of ECI services yields a myriad of benefits. It leads to decreased staff turnover, heightened service quality and more comprehensive services, reduced service redundancy, and streamlined administrative efficiency (Rausch et al., 2021). Additionally, it mitigates stress and enhances satisfaction for both families and professionals. This integrated approach also optimizes time management by reducing service fragmentation (Maluleke et al., 2023).

Research indicates that the early years present a crucial window for implementing effective early childhood interventions, while also highlighting the significant risks associated with exposing children to adverse experiences (Richter et al., 2017). Internationally, there is a growing trend of enrolling children with disabilities in inclusive early childhood programs, where they receive comprehensive support and services from professionals representing various disciplines (Bruder, 2010; Limbrick, 2009). These professionals receive specialized training to equip them with the necessary expertise to foster development across cognitive, motor, communication, and adaptive domains (Odom et al., 2011; Rausch et al., 2021).

A survey in Gauteng, South Africa, conducted by the ECI workgroup, highlighted key training needs for public sector health professionals. These needs encompass implementing and improving ECI services, fostering teamwork, establishing developmental screening services, resource sharing, networking with stakeholders, understanding policy, and exchanging best ECI practices. These identified needs may provide valuable guidance for improvements that should be addressed at a preservice curriculum level (Balton et al., 2020).

Research consistently demonstrates that transdisciplinary teams offer the most effective model for implementing interventions in ECI across various developmental domains for children with disabilities (Rausch et al., 2021; Cumming & Wong, 2012).

Transdisciplinary teams, exemplified by the Team Around the Child (TAC) approach

practiced globally (Limbrick, 2009), are endorsed as a recommended practice in ECI (Hong & Shaffer, 2015; Bricker et al., 2022). This model aligns with the International Classification of Functioning, Disability and Health (ICF) as a unified framework for interdisciplinary collaboration from a biopsychosocial perspective (Simeonsson, 2009). Nonetheless, there's a growing trend of both interdisciplinary and transdisciplinary collaboration in the ECI field (Klein, 2008; Rausch et al., 2021).

While training in ECI is available on a global scale, there remain several challenges to effective inter-professional collaboration. Challenges encompass issues such as communication barriers, differing conceptualizations of needs, and cultural variations among professional groups (Garvis et al., 2016). Many professionals often lack the experience needed to establish, sustain, and effectively monitor teams (Briggs, 1997). This is unsurprising, as the process of forming and sustaining a team involves sophisticated activities that demand knowledge, technical expertise, and interpersonal skills (Sargeant et al., 2008). These attributes can be viewed as the essential building blocks of collaboration, as they are crucial for facilitating effective team dynamics (D'Amour et al., 2005).

The effectiveness of teams relies on the efficiency of communication among team members (Buljac-Samardzic et al., 2011; Blu-Banning et al., 2004). It also hinges on team members' mutual respect (Espe-Sherwindt, 2008), commitment to the team (Yang et al., 2013), and how they collectively set and pursue their goals (Rausch et al., 2021; Yeboah-Antwi et al., 2013). Additionally, teamwork involves the pooling and exchange of information, knowledge, and skills, promoting cooperative efforts (Hong & Shaffer, 2015). Support from the organization is a critical factor (Batorowicz & Shepherd, 2008), encompassing the allocation of time, financial resources, and human resources (Coovadia et al., 2009; Briggs, 1997), which are indispensable for successful collaboration within ECI teams.

ECI professionals in South Africa frequently grapple with challenging work contexts, particularly those serving in rural areas as opposed to urban ones. They often face resource limitations (Zulu et al., 2022; Kyarkanaye et al., 2016), largely due to insufficient funding, leading to the delivery of subpar ECI services (Zulu et al., 2022). A similar problem is observed in other countries like Portugal and Australia, where a lack of resources in ECI services is a critical problem (Albuquerque et al., 2020; Yang, 2010).

Despite the existing body of literature on team collaboration, researchers conclude that there is still a gap in our comprehension of perceptions related to collaborative processes (Clarke, 2010; Castro-Kemp & Samuels, 2022). This gap is particularly pronounced when examining collaborative practices within ECI services (Yang et al., 2013). In the context of South Africa, various contextual factors, including high unemployment, poverty, limited resources, linguistic and cultural diversity, and the country's historical legacy, can significantly influence professionals' perceptions of collaboration within ECI teams (Ashley-Cooper et al., 2019). However, the specific nature of these perceptions in the South African context remains uncharted territory in the current body of knowledge (Kyarkanaye et al., 2016).

Therefore, the aims of this paper were:

- To describe professionals' perceptions of collaboration in ECI services in the Gauteng province of South Africa.
- To correlate professionals' perceptions of collaboration regarding each domain of the survey with age and experience.

Method

Research design

A descriptive survey design was utilized to describe ECI professionals' perceptions of collaboration in ECI teams (McMillan & Schumacher, 2006). The survey was conducted

using a self-administered questionnaire which was hand-delivered to professionals working in ECI teams. Professionals were allowed to complete the survey questionnaire at their leisure.

Participants

Purposeful, specifically criterion, sampling was used to recruit participants. All professionals working in ECI teams and using a team approach at public hospitals and clinics in the city of Pretoria, Gauteng province, South Africa, were selected. Of the 15 institutions (eight hospitals and seven clinics), four hospitals and three clinics gave their permission to participate in the study. The professionals were selected based on the following inclusion criteria: a) minimum of six months of experience in their current ECI team, b) professional must be providing intervention to children from 0-6 years in a hospital or clinic based setting, and c) the professional should be literate in English. A total of 39 professionals working in ECI teams were identified by the coordinator of each institution, of which 34 consented to participate in the study.

Table 1 presents descriptive information of both the professionals working in ECI teams and service information from professionals.

Most of the professionals provided intervention in English (79.4%), had less than five years of experience providing ECI services (61.8%) and are between 20-30 years of age. The majority of professionals are language proficient and provide intervention in English (79.4%) and Afrikaans (44.1%); while fewer professionals are language proficient and provide intervention in African languages. Furthermore, the majority of the professionals received training in ECI in the form of workshops/seminars (82.4%) and in-service training (50%).

Table1. *Descriptive information of participants (N=34)*

Description	Category	N	%
Profession	OT	9	26.5
	Speech –Language Therapist	4	11.8
	Physiotherapist	4	11.8
	Dietician	5	14.7
	Social Worker	4	11.8
	Other	4	11.8
Age	20-30	20	58.8
	31-40	9	26.5
	41-50	4	11.8
	51-60	1	2.9
Highest educational qualifications	Bachelor’s degree	13	38.2
	Honours degree	20	58.8
	Master’s degree	0	0
	PhD	0	0
Home Language	English	7	20.6
	Afrikaans	18	52.9
	African language	9	26.3
Language proficiency (Speak)	English	34	100
	Afrikaans	26	76.5
	isiZulu	7	20.6
	Setswana	6	17.6
	Sesotho	8	23.5
	Sepedi	9	26.5
	Other	9	26.5
	Language proficiency (Read)	English	34	100
Afrikaans	29	85.3	
isiZulu	6	17.6	
Setswana	4	11.8	
Sesotho	6	17.6	
Sepedi	6	17.6	
Other	7	20.6	
Language proficiency (Write)	English	34	100
	Afrikaans	27	79.4
	isiZulu	3	8.8
	Setswana	2	5.9
	Sesotho	4	11.8
	Sepedi	3	8.8
	Other	4	11.8
	Language provided for intervention	English	27	79.4
Afrikaans	15	44.1	
Sepedi	4	11.8	
Sesotho	5	14.7	
isiZulu	7	20.6	
Setswana	4	11.8	
Other	2	5.9	
Years of experience in ECI teams	<5	21	61.8
	5-10	11	32.3
	11-15	1	2.9
	16-20	0	0
	≥21	0	0
Total years of experience	<5	17	50
	5-10	10	29.4
	11-15	3	8.8
	16-20	2	5.9
	≥21	2	5.9
Training in ECI	None	3	8.8

Description	Category	N	%
	In-service training	17	50
	Workshops/seminars	28	82.4
	Postgraduate course	3	8.8
	Other	1	2.9
Frequency of team intervention	Daily	8	23.5
	Weekly	23	67.6
	Monthly	3	8.8
Composition of the team	OT	32	94.1
	Nurse	11	32.4
	Speech-Language therapist	33	97.1
	Doctor		
	Physiotherapist	28	82.4
	Dietician	19	55.9
	Social Worker	20	58.8
	Parent/caregiver	30	88.2
	Other	4	11.8
	Nature of collaboration (Working independently with separate IP)	Yes	4	11.8
Sometimes		21	61.8
No		9	26.8
Nature of collaboration (Working independently with joint IP)	Yes	20	58.8
	Sometimes	12	35.3
Nature of collaboration (Working together and joint IP)	No	2	5.9
	Yes	12	35.3
	Sometimes	19	55.9
	No	3	8.8

The majority of these professionals provide ECI on a weekly (67.6%) basis including the parent as an integral member of the team. In addition, the majority of professionals indicated that they tend to work independently of each other but do develop joint intervention plans, followed by those who indicated that they work together and develop joint intervention plans.

Survey instrument

The Collaborative Practice in Early Childhood Intervention Professional (Yang, 2010) questionnaire, comprising six domains and 87 items, was adapted for the South African context. Malmgreen's (2005) five-step procedure for validating a tool from another English-speaking country was used. A comprehensive process of face and content validation was implemented, involving four panel reviews which included academic experts and professionals working in the field of ECI.

The face validity review of the CECI-P led to changes in terminology for cultural relevance and a reduction in length from 105 to 89 items. The final panel specifically reviewed items common to both the CECI-P and the CECI-C [the CECI-C (caregiver questionnaire) is not presented in this article]. They recommended revising 43 items and deleting two, resulting in a final version of the CECI-P(R) with 87 items. Content validity was assessed using the Content Validity Index (CVI) (Lynn, 1986). Professionals and caregivers rated the items on the CECI-P(R) for their relevance to team collaboration. Based on their feedback, 22 questions were revised. A second CVI confirmed the validity of the revised questionnaire, with no further modifications needed.

The adaptation process yielded the Collaboration in Early Childhood Intervention Professional Revised [CECI-P (R)] questionnaire, which underwent pre-testing in a pilot study. Challenges arose in sourcing team members with at least one year experience. Consequently, the selection criteria were revised to include professionals with a minimum of six months' experience. Additionally, an extra question was incorporated: "What language do you provide intervention in?"

The CECI-P (R) comprises six domains which assessed professionals' perceptions of the i) understanding, ii) self-assessment on collaboration iii) advantages, iv) difficulties, v) factors influencing, and vi) outcomes of collaboration. The CECI-P(R) consisted of 87 items, of which 83 were closed-ended statements and four were open-ended questions. The response format for the CECI-P(R) included a five-point Likert scale. The five-point Likert scale ranged from *strongly disagree* to *strongly agree*, *extremely unimportant* to *extremely important*, *extremely dissatisfied* to *extremely satisfied* and *extremely effective* to *not at all effective*.

Procedure

Approval from the Ethics Committee of the relevant university in South Africa was obtained. Additionally, appropriate permissions were secured from the provincial Department of Health, as well as from the hospitals and clinics accessed in this study. Informed consent was obtained from the professionals working in ECI services. A coordinator from each site was selected based on previous professional acquaintance with the researcher. Each person, who agreed to function as a coordinator, was a therapist working in the ECI team at the research site, and who therefore had access to the other ECI team members.

The researcher hand delivered the survey packs to the coordinator. The coordinator then delivered them to the various ECI team members. Professionals were then able to complete the survey pack at their leisure. The participants then placed their survey pack in the envelope provided and sealed it before returning it to the coordinator, ensuring confidentiality of information. Participants were required to return the survey pack to the coordinator within a week. The coordinator followed up daily with the professionals to ensure their progress with completing the survey pack. Of the 39 survey packs distributed, 34 professionals consented to participate in the study and returned the completed survey pack, yielding a 87% return rate.

Data Analysis

Each completed questionnaire was assigned a unique identification number. Data from the measuring instrument were entered into an electronic spreadsheet for analysis using IBM SPSS Version 23 for Windows. A codebook was developed for the CECI-P(R) to facilitate accurate data entry into SPSS. After entering all data, measures were taken to clean the dataset of errors. SPSS Descriptives were used to identify outliers and missing data. Outliers were corrected, and missing values were coded as 9999. Missing values were deleted pairwise for all statistical procedures in SPSS. To ensure accuracy, a speech-language

therapist with nine years of experience randomly reviewed 20% of the questionnaires and reported 100% accuracy in the data entry process into the Excel sheet.

Descriptive statistics, including measures of central tendency (means, standard deviations, frequency, and effect size), were utilized to organize the collected data, discuss variability in scores, and compare relationships between different sets of data (Maxwell & Satake, 2006; McMillan & Schumacher, 2006). These measures were used to describe the demographics of professionals and the nature of ECI services in South Africa. Importantly, these statistical measures were also used to describe professional collaboration within ECI services in South Africa. All variables in the present study were assessed using inferential statistics, specifically a two-tailed test, namely Spearman Rank-Order Correlations, with a significance level set at $p < 0.05$. The Spearman Rank-Order Correlations were employed to examine relationships between ranked variables, such as components of collaboration with satisfaction, and the effects and effectiveness of collaboration (Viswanathan, 2005).

Responses to the open-ended question (N=10) in the Difficulties with Collaboration domain were recorded verbatim and categorized by the number of participants who mentioned each item. Similar themes or responses were grouped together.

Reliability

The internal consistency reliability of the CECI-P(R) was assessed by calculating Cronbach's alpha, which was .90, indicating high reliability (Maxwell & Satake, 2006). The Cronbach's alpha for each domain is presented in Table 2. It is recommended that the coefficient alpha should be greater than or equal to .70 - .80 (Taber, 2017).

Results

The results are discussed in relation to professionals' perceptions of the respective domains of the survey, namely; understanding of collaboration, self-assessment of collaboration, advantages of collaboration, difficulties with collaboration, factors influencing

collaboration, and outcomes of collaboration. The overall means and standard deviations for each domain, as well as the Cronbach's alpha for each domain, are presented in Table 2.

Table 2. *Descriptive statistics of the domains of the CECI- P(R)*

Domains of CECI-P(R)	Mean	SD	Number of items	α	Interpretation
Understanding of collaboration	4.56	0.41	9	.61	Acceptable
Self-assessment on collaboration	4.62	0.30	10	.64	Acceptable
Advantages of collaboration	4.79	0.31	12	.90	Excellent
Difficulties with collaboration	3.07	0.70	10	.81	Good
Factors influencing collaboration					
-Organisational factors	4.46	0.36	9	.69	Acceptable
-Interpersonal factors	4.65	0.30	20	.89	Good
Outcomes of collaboration					
-Satisfaction with collaboration	3.93	0.77	3	.83	Good
-Effects of collaboration	4.53	0.47	8	.89	Good
-Effectiveness of collaboration ^a			2		

^aTotal mean and standard deviation was not obtained for this sub-domain. This domain is based on single items (Yang, 2010); therefore an alpha is not presented.

Understanding of collaboration

The items that received the most positive ratings were “commitment” to team collaboration ($M = 4.94$, $SD = 0.24$), collaboration is “necessary to provide quality services for young children” ($M = 4.91$, $SD = 0.29$), and “parents should be included in the team” ($M = 4.91$, $SD = 0.29$). Professionals demonstrated a good understanding of collaboration, as indicated by the overall results for the "Understanding of collaboration" domain ($M = 4.56$, $SD = 0.41$). This domain attained an acceptable Cronbach's alpha of .61.

Self-assessment on collaboration

Two items, that is, “encourage[ing] parents to be active members” ($M = 4.88$, $SD = 0.33$) and “respect[ing] parents as partners and full team members” ($M = 4.76$, $SD = 0.43$) had the highest mean scores. The overall results for the “Self-assessment on collaboration” domain ($M = 4.62$, $SD = 0.30$) indicate that professionals believed they were effectively

engaged in collaborative teamwork and were dedicated to family-centered practices. This domain attained an acceptable Cronbach's alpha of .64.

Advantages of collaboration

The mean scores for all items were high, ranging from 4.59 to 4.91. This implies that all professionals perceived collaboration to be beneficial for professionals, parents, and children. Three items that received high ratings with respect to the advantages of collaboration were “professionals learn from each other and improve their skills” (M = 4.91, SD = 0.29), collaboration “benefit[s] young children and their families” (M = 4.85, SD = 0.36) as well as “help parents to access the services needed” (M = 4.85, SD = 0.44). For this domain, an excellent Cronbach's alpha of .90 was attained.

Difficulties with collaboration

The standard deviations for all items were high, implying that professionals had a wider range of opinions on this item. The mean scores show that the professionals' perceptions leaned towards being neutral or did not perceive as many difficulties with collaboration, except for the item “Language barriers of parents from different cultural backgrounds hinder communication” which received the highest mean score (M = 4.00, SD = 0.85). This domain achieved a Cronbach's alpha of .81, indicating a good level of internal consistency.

Ten out of the 34 professionals responded to the open-ended question about additional difficulties with collaboration. These included, and are summarised as: poor communication between team members (2); professionals overstepping the scope of their practice (1); unwilling and poor team member participation in the team (3); insufficient funding and lack of team members (1); poor patient attendance for therapy (2); and insufficient training at an undergraduate level (1).

Factors influencing collaboration

With respect to the “Organizational factors influencing collaboration” sub-domain, the mean scores for all items were high, ranging from 3.91 to 4.79. High scores imply that professionals perceived the organizational factors to be integral to successful collaboration. Three items that received the highest mean scores were in relation to “professional availability” ($M = 4.79$, $SD = 0.41$), “sharing of information” ($M = 4.71$, $SD = 0.52$), and “confidentiality of information” ($M = 4.71$, $SD = 0.58$). This domain attained an acceptable Cronbach's alpha of .69.

With respect to the “Interpersonal factors influencing collaboration” sub-domain, the mean scores for all items were high, ranging from 4.38 to 4.88, implying that professionals perceived all interpersonal factors to be integral to successful collaboration. Of these, the most important interpersonal factors influencing collaboration were related to “mutual respect” ($M = 4.88$, $SD = 0.41$), and “open communication” ($M = 4.88$, $SD = 0.33$). This domain achieved a Cronbach's alpha of .89, indicating a good level of internal consistency.

Outcomes of collaboration

With respect to the “Satisfaction with collaboration” sub-domain, 64.7% ($n = 22$) of the professionals were satisfied and 32.4% ($n = 11$) were extremely satisfied with “working together with families”. Furthermore, with respect to “working together with other professionals”, 50% ($n = 17$) were satisfied, 20.6% ($n = 7$) were extremely satisfied; whilst 8.8% ($n = 3$) were dissatisfied. The results show that professionals were more satisfied with working with families than with other professionals. This domain achieved a Cronbach's alpha of .83, indicating a good level of internal consistency.

The mean scores for the all items in the “Effects of collaboration” sub-domain were high, ranging from 4.35 to 4.76, implying that professionals perceived collaboration to have positive effects for services, children, and families. Two items received the highest mean

scores, that is, professionals perceived that collaboration enabled “parents [to] save time by getting all services from one place” ($M = 4.76$, $SD = 0.43$) and they “are able to access comprehensive services easily” ($M = 4.71$, $SD = 0.46$). This domain achieved a Cronbach's alpha of .89, indicating a good level of internal consistency.

With respect to the effectiveness of collaboration, 8.8% ($n = 3$) of professionals perceived the team to be “extremely effective”, 47.1% ($n = 16$), “highly effective”; whilst 5.9% ($n = 2$) reported that the team was “less effective ($M = 2.41$, $SD = 0.74$).” Furthermore, 11.8% ($n = 4$) perceived parent-professional collaboration to be “extremely effective”, 26.5% ($n = 9$), “highly effective”; whilst 2.9% ($n = 1$), “less effective”, and 2.9% ($n = 1$), “not at all effective ($M = 2.59$, $SD = 0.86$).” Professionals perceived the team collaboration to be more effective than parent-professional collaboration.

Correlation between professionals' perceptions of collaboration with age and years of experience

Table 3 displays Spearman's rho test results, showing correlations between professionals' perceptions of collaboration (understanding, advantages, difficulties, influencing factors, and outcomes) and their age and years of experience providing intervention to young children

There is a positive correlation between years of experience and “organizational factors influencing collaboration” ($r_s(32) = .407$, $p = .017$). This implies that professionals who place greater importance on organizational factors in shaping collaboration tend to have more extensive experience in delivering interventions to young children and vice versa.

Table 3. *Correlation between professionals' perceptions of the domains of the CECI-P(R) and age and years of experience*

Domains	Age	p-value	Years of experience providing intervention to young children between 0-6 years	p-value
Understanding of collaboration	$r_s(32) = -.121$	.495	$r_s(32) = .099$	.579
Advantages of collaboration	$r_s(31) = .122$	.500	$r_s(31) = .327$	.064
Difficulties with collaboration	$r_s(29) = .068$	.716	$r_s(29) = .274$	.136
Factors influencing collaboration				
-Organizational	$r_s(32) = .205$	.246	$r_s(32) = .407^*$	.017
-Interpersonal	$r_s(32) = -.032$	.859	$r_s(31) = .051$	.778
Outcomes of collaboration	$r_s(32) = .120$	.499	$r_s(32) = .102$	.565

* $p < .05$

Correlation between professionals' perceptions of the advantages, difficulties, factors influencing collaboration and satisfaction, effects, and effectiveness of collaboration

Table 4 presents the Spearman's rho results for the correlation between professionals' perception of the advantages, difficulties, factors influencing collaboration, as well as the satisfaction, effects, and effectiveness of collaboration.

There is a positive correlation between professionals' perceptions of "satisfaction of collaboration" and "interpersonal factors influencing collaboration" ($r_s(31) = .400, p = .021$). This implies that professionals who were more satisfied with collaboration were also

significantly more in agreement with the interpersonal factors influencing collaboration and vice versa.

Table 4. *Correlation between professionals’ perceptions of advantages, difficulties and factors influencing collaboration with satisfaction, effects, and effectiveness of collaboration*

	Satisfaction of collaboration	Effects of collaboration	Effectiveness of collaboration	Advantages of collaboration	Difficulties with collaboration	Organizational factors influencing collaboration	Interpersonal factors influencing collaboration
Satisfaction of collaboration	1						
Effects of collaboration	0.275	1					
Effectiveness of collaboration	0.786 [#]	0.330	1				
Advantages of collaboration	0.329	0.702 [#]	0.449 [#]	1			
Difficulties with collaboration	-0.113	-0.017	-0.242	-0.021	1		
Organizational factors influencing collaboration	0.121	0.389 [*]	0.344 [*]	0.544 [#]	0.113	1	
Interpersonal factors influencing collaboration	0.400 [*]	0.514 [#]	0.521 [#]	0.534 [#]	-0.013	0.652 [#]	1

**p < .05, #p < .01*

There is a positive correlation between professionals’ perceptions of the “effects of collaboration” and the “advantages of collaboration” ($r_s(31) = .702, p = .000$), as well as “interpersonal factors influencing collaboration” ($r_s(31) = .514, p = .002$). Furthermore, there is a positive correlation between professionals’ perceptions of the “effects of collaboration” and the “organizational factors influencing collaboration” ($r_s(32) = .389, p = .023$). This suggests that professionals who perceive substantial advantages in collaboration and strongly

endorse both interpersonal and organizational factors that influence collaboration also report positive effects resulting from collaboration, and vice versa.

There is a positive correlation between professionals' perceptions of the "effectiveness of collaboration" and the "advantages of collaboration" ($r_s(31) = .449, p = .014$). There is a positive correlation between professionals' perceptions of the "effectiveness of collaboration" and "organizational factors influencing collaboration" ($r_s(32) = .344, p = .046$). Furthermore, there is a positive correlation between professionals' perceptions of the "effectiveness of collaboration" and "interpersonal factors influencing collaboration" ($r_s(31) = .521, p = .001$). This implies that professionals who perceived significant advantages to collaboration and who strongly agreed with the organizational factors and interpersonal factors influencing collaboration also perceived greater team effectiveness and vice versa.

Discussion

The findings of this study showed high positive ratings for most items implying that professionals have a good understanding of collaboration and perceived collaboration to be important when providing services to young children and their families, particularly professionals with greater years of experience. Despite the favourable findings, it's crucial to approach the results of this study with caution. This caution arises because, although certain alpha values for domains in the measure are deemed acceptable, their relatively low levels still impact the measure's reliability.

In South Africa, the transdisciplinary model is recommended over the interdisciplinary and multidisciplinary models (Abdoola et al., 2019; Castro-Kemp & Samuels, 2022) in order to make better use of the country's scarce professional resources. However, the transdisciplinary approach is not always practiced in ECI (Uys & Samuels, 2010; Castro-Kemp & Samuels, 2022). This was evident in the findings of the current study

which showed that the majority of professionals engaged in interdisciplinary (58.8%) teaming, followed by transdisciplinary (35.3%) collaboration. The paucity in transdisciplinary teaming in South Africa can be attributed to a lack of professional competence (Fordham et al., 2011) and training (Castro-Kemp & Samuels, 2022; Ziviani et al., 2013) in the approach.

Training in the transdisciplinary approach is crucial in South Africa due to the shortage of health professionals specialized in providing intervention to young children and their families (Samuels et al., 2012; Rausch et al., 2021), as identified by professionals in the current study. In recognition of the value of the transdisciplinary approach, in South Africa there is an intensive two-year Master's program in the field of ECI that emphasizes this collaborative team approach (Eloff et al., 2006; Samuels et al., 2012) in which one of the participants was involved. However, this postgraduate training program alone, may not be sufficient to advance the transdisciplinary approach in South Africa.

It is well acknowledged that professional expertise is essential when delivering services to young children and their families (Batorowicz & Shepherd, 2008; Briggs, 1997; Ziviani et al., 2013), which was also recognized by professionals in the current study. Sharing of expertise, central to transdisciplinary teaming, posed as a challenge for one team member in the current study who expressed dissatisfaction with "professionals overstepping their scope of practice," similar to the results in the Cumming and Wong (2012) study. Such findings are important, because professionals' beliefs have been identified as a potential influence on whether they use or adopt practices (Kucukarslan et al., 2011). Results of the current study also suggest that whilst professionals express beliefs that align with recommended practices (King et al., 1998; McWilliam, 2000), such as the transdisciplinary approach, they do not always conduct their day-to-day practices in a manner that reflects those beliefs (McWilliam, 2000).

The interpersonal skills of team members have the potential to influence collaboration in ECI services (Dinnebeil et al., 1999). Equal partnership demands open and honest communication (Briggs, 1997; Buljac-Samardzic et al., 2011). Whilst professionals in the current study acknowledge that open communication is essential for collaboration two professionals reported in the “Difficulties with collaboration” domain that there is poor communication between team members.

Furthermore, mutual respect is essential when collaborating in ECI services and is generally displayed when team members support each other (Blu-Banning et al., 2004; Espe-Sherwindt, 2008), especially for group cohesion (Mickan & Rodger, 2005). When there is mutual respect, families and professionals feel mutually valued (Woods et al., 2011). Professionals in the current study regarded mutual respect to be highly important for collaboration, similar to findings in the literature (Moran et al., 2007; Yang et al., 2013).

Professionals were more satisfied working with families (97.1%) compared to working with other professionals (70.6%) similar to the Yang et al. (2013) study. Perhaps the findings from professionals may suggest that the interpersonal relationships between professionals require strengthening, and that this may lead to increased satisfaction with collaboration between professionals. The current study showed that professionals strongly perceived interpersonal factors to be important for collaboration were also more satisfied with collaboration.

In services where there are limited resources, the sharing of resources is essential and when there is a pooling of resources team members express increased satisfaction. Researchers have also highlighted that when resources are not shared amongst team members, it is considered a grave barrier to collaboration (Kyarkanaye et al., 2016). Remarkably, the item on the sharing of resources was rated positive but lower when compared to other items in the domain which may suggest that professionals in the current

study may not have perceived the sharing of resources to be highly important for collaboration, similar to the results in the Yang et al. (2013) study.

Scholars in the field of ECI assert that teams who do not receive support from their organizations in relation to human, time and financial resources, are severely handicapped (Bose & Hinojosa, 2008; Briggs, 1997; Mickan & Rodger, 2005), as concurred by professionals in the current study with greater years of experience. However, the notably high ratings for collaboration may be attributed to the resilience demonstrated by both children and professionals within the South African context (Richter et al., 2019). Nevertheless, collaboration in ECI services can be viewed from a systems perspective, aligning with the ICF model, which is not only dependent on the team members but also on the organization in which the ECI service is embedded (Bronfenbrenner, 1979).

Early childhood interventionists have progressively come to appreciate the advantages of closer collaboration, where each professional contributes uniquely to addressing the specific needs of children (Kyarkanaye et al., 2016). Furthermore, effective inter-professional collaboration goes beyond merely gathering insights from different contributors; it necessitates a fresh mindset that transcends traditional working models. Team members harness the expertise of each member, remaining open to redefining the boundaries of their work—a collaborative spirit that challenges the binary approach. (Hallman, 2012).

Conclusion

Overall, the results showed high positive perceptions by professionals, indicating a good understanding of collaboration, perceived positive advantages and outcomes to collaboration, perceived it to be effective, and were satisfied with the collaboration in teams. Resources, efficient communication, mutual respect and sharing of information were regarded as highly important by professionals. However, the transdisciplinary model, whilst regarded as best practice, has not been fully ratified by professionals working with young

children and their families in ECI services in South Africa. Despite the positive findings, it's essential to interpret the results of this study with caution. This caution stems from the fact that while some alpha values for domains in the measure fall within an acceptable range, their relatively low levels affect the measure's reliability.

Limitations and recommendations for future research

The present study exhibits several limitations. The participation of a limited number of sites and a relatively small sample size ($N = 34$) restricts the generalizability of the findings. Additionally, the constrained sample size hinders comparisons across different settings (hospitals and clinics) and precludes the exploration of variable relationships through factor analysis (Nunnally, 1978).

The findings of this study showed high positive perceptions for most items implying that professionals have a good understanding of collaboration and perceived collaboration to be important when providing ECI services. However, it's crucial to note that the study sample predominantly comprised professionals from urban areas. This introduces the possibility of bias, as professionals mostly in rural areas across South Africa, often encounter distinct challenges, such as limited human resources and financial constraints (Ashley-Cooper et al., 2019).

Another concern pertains to the distribution of the professional measures. These measures were manually handed over to a coordinator, who was the manager of the rehabilitation service and part of the ECI team, at each institution. The coordinator was then responsible for disseminating and collecting the measures from all professionals within the ECI teams. Consequently, there is uncertainty regarding whether all professionals on the ECI team were accessed.

Furthermore, while some of the alpha values fall within the acceptable range, they are relatively low, impacting the measure's reliability. Therefore, the CECI-P(R) should be

revised to improve its internal consistency. Future research should prioritize additional reliability and validity testing of the CECI-P(R) using a larger sample of respondents. Following such testing, a condensed version of the CECI-P(R) could be formulated, incorporating elements such as factor analysis, test-retest reliability, construct validity, and concurrent validity. Additionally, qualitative research methodologies, such as focus groups and in-depth interviews, could offer deeper insights into professionals' perceptions of collaboration.

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