

Introduction

- Respiratory therapists (RTs) should possess and use critical thinking when caring for patients and is an essential skill that professional RTs must cultivate to provide safe, evidence-based respiratory care to highly complex patient populations.
- There are a variety of critical thinking assessment options available depending on venue and clinical context
- Along with foundational respiratory care knowledge, RTs caring for neonatal-pediatric patients with congenital heart defects and acquired heart diseases also require a specific knowledge of complex anatomy, physiology, and gas exchange capabilities.
- The purpose of this pilot study was to assess, measure, and compare the critical thinking skillset of professional RTs working in a neonatal-pediatric cardiac intensive care unit (CICU) using a validated critical thinking self-assessment questionnaire¹ and the Health Professional Critical Thinking assessment (HPCTA) (Insight Assessment, Hermosa Beach, CA: California Academic Press).

Figure 1. Number of Years Worked Within the CICU.

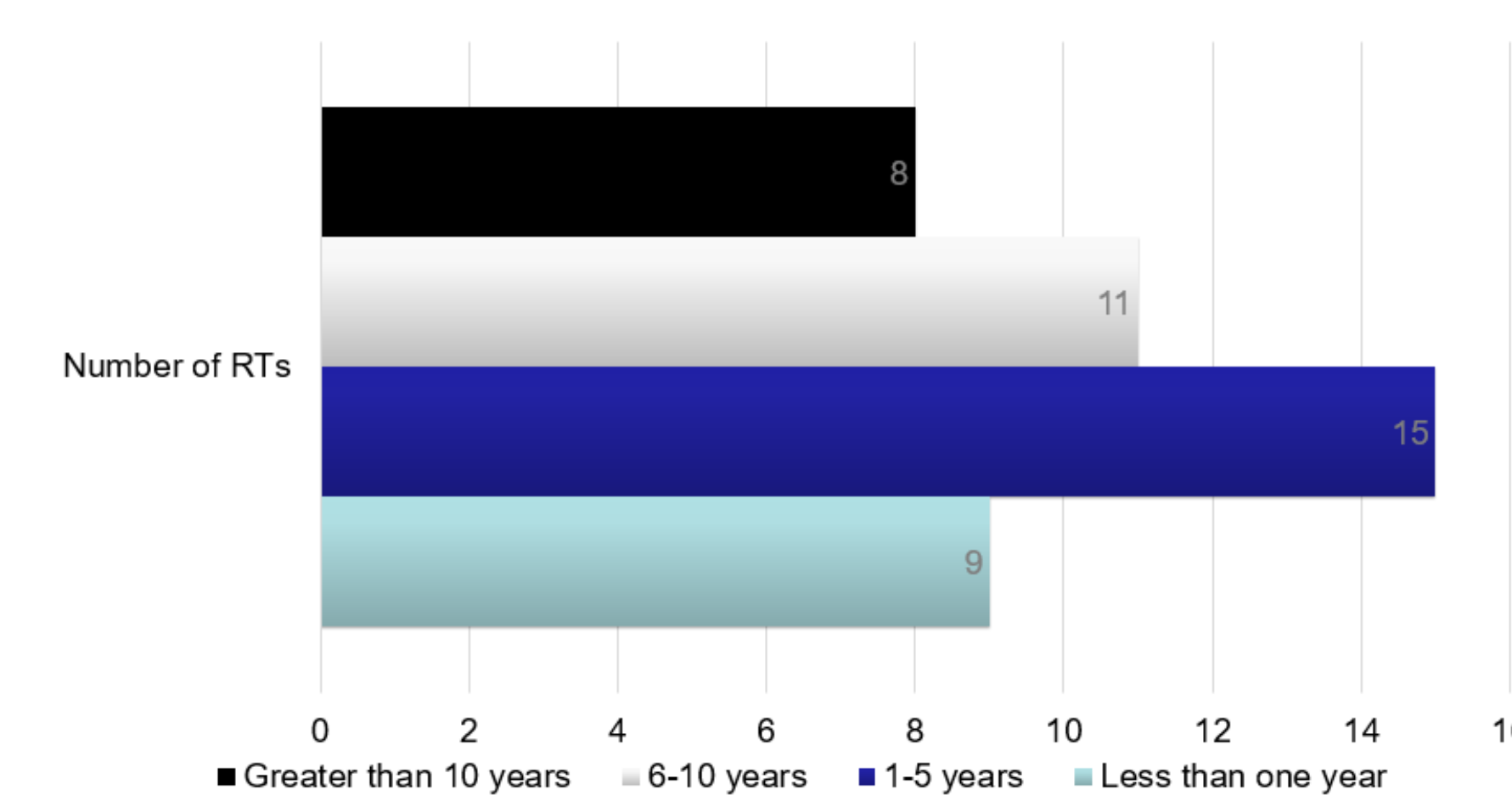


Figure 2. Total Number of Years Working as a Professional RT.

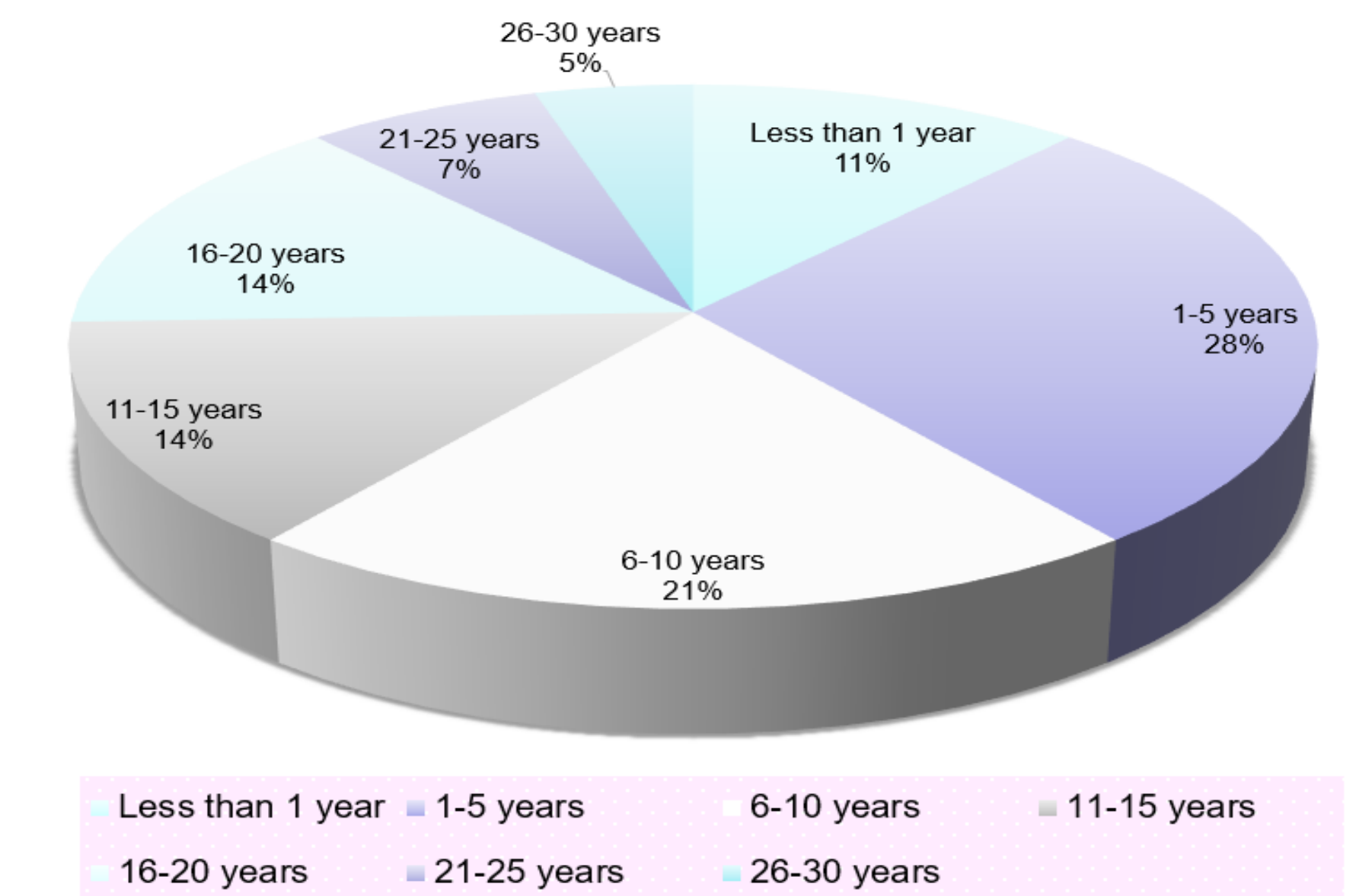


Table 2. Self-Assessment Results. *M* = Mean. *SD* = Standard deviation. *QW* = Quite well. *VW* = Very Well. *EW* = Extremely well.

Self-Assessed Critical Thinking Construct	<i>M</i>	Median	<i>SD</i>	Minimum Score	Maximum Score	Categorical Interpretation
Communicating	4.95	5.00	0.77	3.50	6.00	VW to EW
Prioritizing	4.92	5.00	0.68	3.43	6.00	VW to EW
Reflecting	4.78	5.00	0.78	2.67	6.00	VW to EW
Decision-making	4.73	5.00	0.69	3.00	6.00	VW to EW
Negotiating	4.53	5.00	0.79	2.75	5.75	VW to EW
Anticipating	4.52	5.00	0.77	2.80	6.00	VW to EW
Troubleshooting	4.30	5.00	0.84	2.50	5.67	QW to EW

Table 3. Summary of OLS regression between the Self-Assessment critical thinking skills and individual HPCTA scores. *N* = 43. *B*: Beta Coefficient. *SE*: Standard Error. *p*: Level of Significance < 0.05*

	Prioritizing	Anticipating	Troubleshooting	Communicating	Negotiating	Decision-making	Reflecting
<i>Analysis</i>	<i>B</i> (SE, <i>p</i>)	<i>B</i> (SE, <i>p</i>)	<i>B</i> (SE, <i>p</i>)	<i>B</i> (SE, <i>p</i>)	<i>B</i> (SE, <i>p</i>)	<i>B</i> (SE, <i>p</i>)	<i>B</i> (SE, <i>p</i>)
<i>Analysis</i>	-4.57 (3.12, 0.15)	-2.11 (2.86, 0.46)	1.99 (2.45, 0.42)	0.75 (2.32, 0.97)	1.18 (2.71, 0.66)	-0.99 (2.87, 0.73)	1.79 (1.94, 0.36)
<i>Interpretation</i>	0.68 (2.10, 0.75)	-4.39 (1.92, 0.02)*	1.32 (1.65, 0.42)	1.36 (1.56, 0.37)	1.34 (1.82, 0.46)	0.35 (1.93, 0.85)	-0.14 (1.30, 0.91)
<i>Inference</i>	-1.93 (2.21, 0.38)	-3.71 (2.02, 0.07)	1.93 (1.73, 0.27)	0.20 (1.64, 0.90)	0.36 (1.91, 0.85)	1.60 (2.03, 0.43)	0.92 (1.37, 0.50)
<i>Evaluation</i>	0.02 (2.14, 0.99)	-4.51 (1.96, 0.03)*	3.10 (1.68, 0.07)	1.73 (1.59, 0.28)	-0.58 (1.85, 0.75)	0.13 (1.97, 0.94)	0.29 (1.33, 0.83)
<i>Explanation</i>	-1.52 (2.42, 0.53)	-3.59 (2.22, 0.11)	1.22 (1.90, 0.52)	0.86 (1.80, 0.96)	1.06 (2.10, 0.61)	2.97 (2.23, 0.19)	-0.05 (1.51, 0.97)
<i>Induction</i>	-2.29 (2.27, 0.31)	-3.09 (2.07, 0.14)	2.69 (1.78, 0.13)	1.87 (1.68, 0.27)	-0.36 (1.97, 0.85)	1.56 (2.09, 0.45)	-0.24 (1.41, 0.86)
<i>Deduction</i>	-3.05 (2.72, 0.27)	-3.48 (2.49, 0.17)	2.16 (2.14, 0.31)	0.16 (2.20, 0.93)	0.36 (2.36, 0.88)	1.45 (2.50, 0.56)	-0.50 (1.69, 0.76)
<i>Numeracy</i>	-1.69 (2.31, 0.46)	-2.99 (2.11, 0.16)	2.17 (1.81, 0.23)	0.34 (1.71, 0.84)	1.05 (2.00, 0.60)	0.03 (2.12, 0.99)	-0.36 (1.43, 0.79)

Methods

- Fifty-four RTs working within the CICU from a large 600+ bed pediatric teaching hospital were solicited via email to participate in the study; forty-three RTs agreed to participate in the study and completed both critical thinking assessments via an online platform, using secured hyperlinks, over a three-month period.
- Mean, standard deviation, frequency, percentages, and minimum/maximum ranges were used to describe the study sample.
- Ordinal least square regression and Spearman's rank correlation analyses (SAS Analytic Software for Windows, Cary, NC, SAS Institute) were used to assess the relationship between the therapists' critical thinking assessment results and their demographic characteristics.

Acknowledgements

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Table 1. RT Demographical Data. ACCS= Adult Critical Care Specialist, NPS= Neonatal Pediatric Specialist, SDS= Sleep Disorders Specialists.

Demographics	Frequency (N=43)	Percentage (%)
Gender		
Male	13	30
Female	30	70
Age Range (in years)		
20-25	9	21
26-30	7	16
31-35	8	19
36-40	6	14
41-45	3	7
46-50	9	21
51-55	1	2
Race/Ethnicity		
Caucasian (Non-Hispanic)	41	95
Hispanic	2	5
Additional Credentials		
ACCS	1	2
NPS	22	51
SDS	1	2
No other additional credentials	21	49
Highest Educational Degree		
Associate's Degree	7	16
Bachelor's Degree	26	61
Master's Degree	10	23

Table 3. HPCTA Raw Score Descriptive Data. *SD* = Standard deviation.

HPCTA Critical Thinking Constructs	Mean Raw Score	Median Score	<i>SD</i>	Range	Categorical Interpretation Range
Overall Critical Thinking Score	285	284	5.48	272-296	Moderate
Individual Skills Constructs					
Induction	289	290	5.79	275-298	Strong
Explanation	287	287	6.02	271-297	Strong
Inference	285	285	5.72	272-298	Moderate
Analysis	284	284	7.85	268-300	Moderate
Deduction	281	280	6.92	269-298	Moderate
Numeracy	280	280	5.74	265-294	Moderate
Interpretation	280	281	5.48	269-292	Moderate
Evaluation	279	277	5.59	269-292	Moderate
Disposition Constructs					
Inquisitiveness	32	32	3.12	24-39	Strong
Maturity of Judgement	31	30	2.72	25-36	Positive
Confidence in Reasoning	30	29	2.68	23-37	Positive
Openminded	30	30	2.65	23-34	Positive
Systematicity	29	29	3.12	21-35	Positive
Analyticity	29	29	2.08	25-33	Positive
Truth-seeking	28	28	2.35	23-33	Positive

Results

- The RTs' demographic data can be found in Figure 1, Figure 2, and Table 1.
- The RTs rated their self-assessed critical thinking skills as quite well to extremely well (see Table 2), whereas they had moderate critical thinking skills and positive critical thinking dispositions on the HPCTA (see Table 3).
- The RTs' self-assessed critical thinking skills were not statistically significant predictors for their overall measured critical thinking score and only select constructs correlated with one another (see Table 4).
- There was a statistically significant, moderate negative correlation between the RTs' self-assessed ability to anticipate and their measured interpretation skills, $r_s(41) = -0.415$, $p < .05$, and inference skills, $r_s(41) = -0.332$, $p < .05$. There was a statistically significant, moderate negative correlation between the RTs' self-assessed ability to prioritize and their measured inference skills, $r_s(41) = -0.300$, $p < .05$, from the HPCTA.
- Collectively, the RTs' demographic characteristics were not statistically significant predictors of their measured critical thinking skills; however, male RTs had higher measured explanation ($F_{1,20} = -4.22$, $p = .05$) and evaluation ($F_{1,20} = 7.90$, $p = .01$) skills.

Conclusion

- Self-assessed critical thinking results should not be a substitute for measured critical thinking results.
- There is a need to develop ongoing critical thinking learning activities and assessments for professional RTs that promotes improvement of their critical thinking capabilities.
- Additional studies are needed to assess professional RTs' critical thinking skills in a variety of settings, along with a validated, discipline-specific critical thinking assessment tool that measures RTs' critical thinking skills.

References

- Goodfellow LT. Respiratory therapists and critical-thinking behaviors: A self-assessment. *J Allied Health* 2003;30(1):20-25.

Disclosures

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