

Increasing Empathy for Children in Dental Students Using Virtual Reality

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Background

Virtual reality (VR) can be used to simulate the view-point of a child to allow dental students to experience what a child experiences during a dental visit.¹

Aim

This study evaluated the effect of VR simulation on the empathy and comfort managing children among dental students.

Design

Sixty dental students experienced a VR scenario created for the study. Empathy levels were examined using the Jefferson Scale of Empathy (JSE)². A self-administered questionnaire collected information on self-perceived ability, comfort, and impact of the intervention.

Materials

A VR scenario depicting the point of view of a 4-year-old boy visiting a dentist for a first visit examination and prophylaxis was created for the study. Script-writing was undertaken by a paediatric dentist (HS) and reviewed for content by another (BL). There were 2 parts to the scenario, consisting of a negative example followed by a positive example.

(<https://www.youtube.com/watch?v=oz4dm45Imkw>)

Results

There was a significant ($p=0.004$) increase (indicating greater empathy) in JSE scores between Pre-intervention (112.35 ± 9.34) and Post-intervention (117.64 ± 10.03), which returned to baseline 3 months later (112.72 ± 10.36).

Dental students perceived themselves to be more confident at communicating (6.45 ± 1.64 Vs 5.75 ± 1.71 , $p=0.011$) and interacting (6.63 ± 1.44 Vs 6.00 ± 1.78 , $p=0.046$) with children after intervention. (Table 1) All (100%) felt that the VR scenarios helped them better empathize with children. (Table 2)

Table 1 Self-perceived comfort and ability in managing paediatric dental patients

Questions	Session (mean \pm SD)			p-value ^a
	Pre-intervention (n=60)	Post-intervention (n=60)	Post-clinic (n=53)	
How much do you like interacting with children (aged 3-8 years old)?	6.52 \pm 2.02 ^a	6.87 \pm 1.69 ^a	6.11 \pm 1.94 ^a	0.080
How confident are you at communicating with children (aged 3-8 years old)?	5.75 \pm 1.71 ^a	6.45 \pm 1.64 ^a	6.06 \pm 1.50 ^{ab}	0.030 ^a
How confident are you at interacting with children (aged 3-8 years old)?	6.00 \pm 1.78 ^a	6.63 \pm 1.44 ^a	6.04 \pm 1.52 ^a	0.045 ^a
How confident are you doing dental procedures on children (aged 3-8 years old)?	4.67 \pm 1.63 ^a	5.50 \pm 1.57 ^a	5.21 \pm 1.71 ^a	0.018 ^a

^a $p \leq 0.05$

†Kruskal-Wallis one-way analysis of variance

^{abc} Values demarcated with the same lowercase superscript letters in the same row indicate that they are not significantly different ($p>0.05$) with the Mann-Whitney U test.

Only 30% revised with the scenario and they were significantly more likely ($p<0.001$) to find it helpful for actual clinical sessions. (Table 3) A keyword analysis³ (Figure) illustrates what the dental students felt were the “greatest takeaway from the VR experience”. The most commonly cited words include: “Child”, “Understand”, “Experience (feel)” and “Perspective (see)”.

Table 3 Comparison between the dental students who used the VR scenarios for revision and those who did not

Parents who did not	Dental student scores/perceived mean (mean \pm SD)		
Survey questions	Used VR for revision (n=16)	Did not use VR for revision (n=37)	p-value†
Jefferson scale of empathy score	7.15 \pm 1.195	6.81 \pm 0.80	0.357
How much do you like interacting with children (aged 3-8 years old)	6.56 \pm 1.75	5.92 \pm 2.01	0.167
How confident are you at communicating with children (aged 3-8 years old)?	6.50 \pm 1.32	5.86 \pm 1.55	0.145
How confident are you at interacting with children (aged 3-8 years old)?	6.63 \pm 1.09	5.78 \pm 1.62	0.082
How confident are you doing dental procedures on children (aged 3-8 years old)?	5.63 \pm 1.67	5.03 \pm 1.72	0.157
The VR scenario helped prepare me for the dental clinical scenario	4.56 \pm 0.51	3.68 \pm 0.63	>0.001*

* $p < 0.05$

† Mann-Whitney U test except Jefferson scale of empathy (T Test)

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

Table 2 Dental student feedback on the virtual reality intervention

Questions	Number of subjects (%)		
	Definitely negative†	Neutral†	Definitely positive†
The VR scenario has helped me better empathise with children's fear of the healthcare setting.	0 (0)	0 (0)	60 (100)
The VR scenario made me more comfortable in communicating with children.	2 (3)	10 (17)	48 (80)
The VR scenario has improved my overall confidence in interacting with children.	1 (2)	10 (17)	49 (81)
The VR scenario has improved my confidence of doing dental procedures on children.	2 (3)	27 (45)	31 (52)

†Definitely negative (strongly disagree = 1, disagree = 2), Neutral (neutral = 3), Definitely positive (agree = 4, strongly agree = 5)

Conclusions

VR could be used to improve empathy, self-perceived comfort and ability at managing children in dental students. However, they should be encouraged to revise using it to maintain this effect.

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References

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