Journal of Health, Medicine and Nursing
ISSN 2422-8419 An International Peer-reviewed Journal
Vol.116, 2024

Benefits of Digital Storytelling Towards Holistic Pain Assessment Among Nursing Students: A Validation Study Using Confirmatory Factor Analysis and Structural Equation Modeling

Tamara J. Theis-Henry (Corresponding Author)
Helene Fuld College of Nursing, NY, USA
24 E 120th Street, New York, NY 10035, USA
E-mail: tamara.henry@helenefuld.edu

Yvonne Tagoe
Helene Fuld College of Nursing, NY, USA
24 E 120th Street, New York, NY 10035, USA
E-mail: yvonne.tagoe@helenefuld.edu

Lynevarda Dade
Helene Fuld College of Nursing, NY, USA
24 E 120th Street, New York, NY 10035, USA
E-mail: lynevarda.dade@helenefuld.edu

Omorobiye Idehen
Helene Fuld College of Nursing, NY, USA
24 E 120th Street, New York, NY 10035, USA
E-mail: omorovbiye.idehen@helenefuld.edu

Abstract

This study aims to test the psychometric properties of the "Holistic Pain Assessment Questionnaire" among nursing students. It also investigated the relationships between compassionate, emphatic communication, active listening, patient advocacy, preventative care knowledge, and holistic nursing education. By employing Martha Rogers' Theory of Unitary Human Beings, the study explored the effectiveness of digital storytelling in pain assessment instruction. The data exhibits non-significant skewness (z = 576, χ^2 = 560, p = .312), while kurtosis is marginally significant (z = -1.93, χ^2 = 209, p = .054). Results showed that exposure to digital storytelling improved nursing students' caring skills scores. Structural equation modeling demonstrated good fit to the data, supported by non-significant p-values and acceptable fit indices like SRMR and RMSEA. Pretest Q3 (0.7414) had the highest R^2, and Posttest 2 Q4 (0.7795) had the highest among posttest questions. Pretest Q5 (0.8983) and Posttest 2 Average (0.8748) had notably high R^2 values, indicating strong explanatory power. However, compassionate, emphatic communication, active listening, and patient advocacy showed negative R^2 values. Most estimates were statistically significant, except for active listening in relation to holistic nursing education. There was a significant positive association between preventative care knowledge and holistic nursing education (β = 0.1922, p < .001, 95% CI: [0.1124, 0.2719]), indicating a correlation between increased preventative care knowledge and higher levels of holistic nursing education, further supported by a strong z-value of 4.724. The study underscores the potential of digital storytelling for holistic nursing education.
Keywords: pain assessment, holistic, CFA, SEM
DOI: 10.7176/JHMN/116-04

Publication date: May 30th 2024

1. Background

The research underscores the significance of holistic nursing care and advocates for a comprehensive approach to knowledge development in nursing education. It proposes the use of digital storytelling as an effective educational method, supported by evidence highlighting existing challenges and the potential for further investigation and intervention. Holistic nursing care, rooted in Martha Rogers' Theory of Unitary Human Beings, emphasizes the interconnectedness of a patient's physical, mental, emotional, and spiritual well-being for holistic healing (McEwan & Wills, 2021). The study focuses on the integration of holistic nursing concepts into pain assessment, identifying it as a primary concern. It underscores the necessity of holistic knowledge advancement

in nursing education. Digital storytelling emerges as a promising strategy, particularly in enhancing the understanding of content covered in ATI® Skills Modules 3.0 (Virtual Scenario: Pain assessment), which students translate into compassionate caregiving practices. Additionally, the research aims to explore how personalized delivery of online learning resources, leveraging available educational technology solutions, can facilitate more profound learning experiences for nursing students. The provision of peer tutoring on pain assessment by senior nursing students is viewed as a form of holistic support, contributing to the overall well-being of learners.

2. Methods

Dataset was derived from a previous independent study involving 30 nursing student participants at Helene Fuld College of Nursing. Half of the sample resort to digital storytelling in Microsoft PowerPoint slides while the other group had ATI® Skills Modules 3.0 (Virtual Scenario: Pain assessment).

We used Jamovi (ver. 2.3.26) to conduct Confirmatory Factor Analysis (CFA) to evaluate our variables and confirm their alignment with our theoretical framework. The CFA results underscore the reliability and internal consistency of the "**Holistic Pain Assessment Questionnaire**," establishing a robust foundation for our study's outcomes. Additionally, the Composite Reliability (CR) and Average Variance Extracted (AVE) metrics derived from the analysis offer valuable insights into the instrument's reliability and convergent validity, essential for ensuring the accuracy and coherence of the measured constructs.

Furthermore, we implemented a Structural Equation Model (SEM) to examine the relationships between latent variables. The Standardized Root Mean Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA) provide insights into the degree of agreement between our model and the collected data in our research.

3. Results

3.1. Confirmatory Factor Analysis

CFA was conducted during the pretest to assess the 15-item "**Holistic Pain Assessment Questionnaire**" based on a three-factor, single-order, multidimensional model. In Table 1, factor loadings ranged from 0.045 to 0.802 on Factor 1/Subscale: "**Compassionate Communication Empathy**," from 0.604 to 0.729 on Factor 2/Subscale: "**Active Listening**," and from 0.637 to 0.840 on Factor 3/Subscale: "**Patient Advocacy**". With the exception of items Q1 and Q2, all factor loadings surpassed the .50 threshold (Liao, Huang, & Wang, 2022). Alternatively, a loading factor value greater than .30 still indicated a good item (Faradillah & Adlina, 2021).

The CFA model fit was evaluated using maximum likelihood for exact fit with the chi-square index ($\chi 2$) and approximate fit with the standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis index (TLI). Specifically, the exact fit was statistically significant, with $\chi 2$ (df) = 191.686, $p < .001$, indicating a good model fit. The SRMR (0.076) was deemed acceptable based on the recommended value of < .08. However, the RMSEA (0.165 at 90% CI [0.134, 0.197]) exceeded the acceptable range of .05 to .08. Additionally, the CFI (0.832) fell below the .95 cutoff, and the TLI (0.797) was below the .90 cutoff (Liao, Huang, & Wang, 2022; Li, Huang, & Feng, 2020).

We computed the composite reliability (CR) for each latent variable and the average variance extracted (AVE) utilizing an Excel spreadsheet, which can be accessed at https://www.analysisinn.com/post/how-to-calculate-average-variance-extracted-and-composite-reliability/. CR evaluated the internal consistency of indicators within a specific domain, while AVE quantified the extent of variance in the indicators explained by each domain in contrast to the variance attributed to measurement error (Verdugo-Alonso et al., 2017).

The CR of the 3 subscales were below the cutoff of ≥ .70 (Cheung et al., 2023) in the following: "**Compassionate Communication and Empathy**" = 0.383; "**Active Listening**" = 0.640; and "**Patient Advocacy**" = 0.667.

AVE for first-order factors should be at least .50 to show convergent validity (Cheung et al., 2023; Nguyen et al., 2022). AVE was greater than .50 in the subscale "**Patient Advocacy**" (0.667) but low in "**Compassionate Communication Empathy**" (0.159) and "**Active Listening**" (0.264).

Table 1

Composite reliability and average variance extracted per CBI subscale

Subscale	Factor Loading	CR	AVE
Compassionate Communication Empathy	0.383	0.383	0.159
1. To what extent do you provide emotional support to the patient's family when a patient is nearing the end of their life, and their family members are present?	0.070		
2. How often do you provide resources for counseling or support groups to a patient diagnosed with a life-altering condition and struggling to cope emotionally?	0.045		
3. How often do you support and facilitate a patient's request to speak with a chaplain when they express concerns about their spiritual well-being?	0.676		
4. To what extent do you believe that a patient who is frequently isolated from social interactions and seems withdrawn may impact their overall well-being?	0.694		
5. In addressing a patient with a chronic illness who seems anxious and stressed, how often do you believe you have addressed their holistic care needs despite addressing physical symptoms?	0.802		
Active Listening	0.640	0.640	0.264
6. How often have you explored affordable medication alternatives or resources to assist a patient struggling with non-adherence to their medication regimen due to financial constraints?	0.792		
7. How often have you considered a patient's emotional well-being when caring for a patient with a chronic illness who seems anxious and stressed, in addition to addressing their physical symptoms?	0.767		
8. When caring for a pediatric patient, how often do you involve the child's family in the care plan and consider their emotional and psychological needs?	0.725		
9. How often have you collaborated with other healthcare professionals to provide comprehensive care for a patient with a complex medical history and multiple chronic	0.604		

	conditions?			
10.	In addressing a patient with a terminal illness, to what extent do you consider their emotional and psychological needs along with their physical comfort?	0.729		
Patient Advocacy		0.667	0.667	0.667
11.	When caring for a pediatric patient, how often do you involve the child's family in the care plan and consider their emotional and psychological needs?	0.840		
12.	How often do you explore alternative pain management methods such as relaxation techniques or music therapy in addition to administering pain medication to a patient recovering from surgery and experiencing pain?	0.637		
13.	You have a patient from a different cultural background who follows specific dietary restrictions due to their cultural beliefs. How often do you consider these beliefs when planning their meals?	0.817		
14.	A patient has expressed concerns about their spiritual well-being and has requested to speak with a chaplain. How often do you support and facilitate this request?	0.740		
15.	When a patient express concerns about their body image following surgery, how often have you provided emotional support and resources to address their body image issues?	0.744		

Note. Composite Reliability, CR; Average Variance Extracted, AVE

3.2. Structural Equation Modeling

These equations represent a structural equation model (SEM) where latent variables such as "**Compassionate Communication Empathy**," "**Active Listening**," and "**Patient Advocacy**" are hypothesized to influence observed variables such as "**PreQ1**," "**PreQ2**," and so forth, which likely represent specific survey items or indicators related to the constructs being measured. The tilde (~) symbol indicates the relationship between the latent and observed variables, suggesting that the latent variables are predictors of the observed variables.

Equation 1:

efa ("efa1") * Compassionate Communication Empathy + efa ("efa1") * Active Listening + efa ("efa1") * Patient Advocacy = ~ PreQ1 + PreQ2 + PreQ3 + PreQ4 + PreQ5 + Post1 Q1 + Post1 Q2 + Post1 Q3 + Post1 Q4 + Post1 Q5 + Post2 Q1 + Post2 Q2 + Post2 Q3 + Post2 Q4 + Post2 Q5

Note. Exploratory factor analysis, efa

Equation 2:

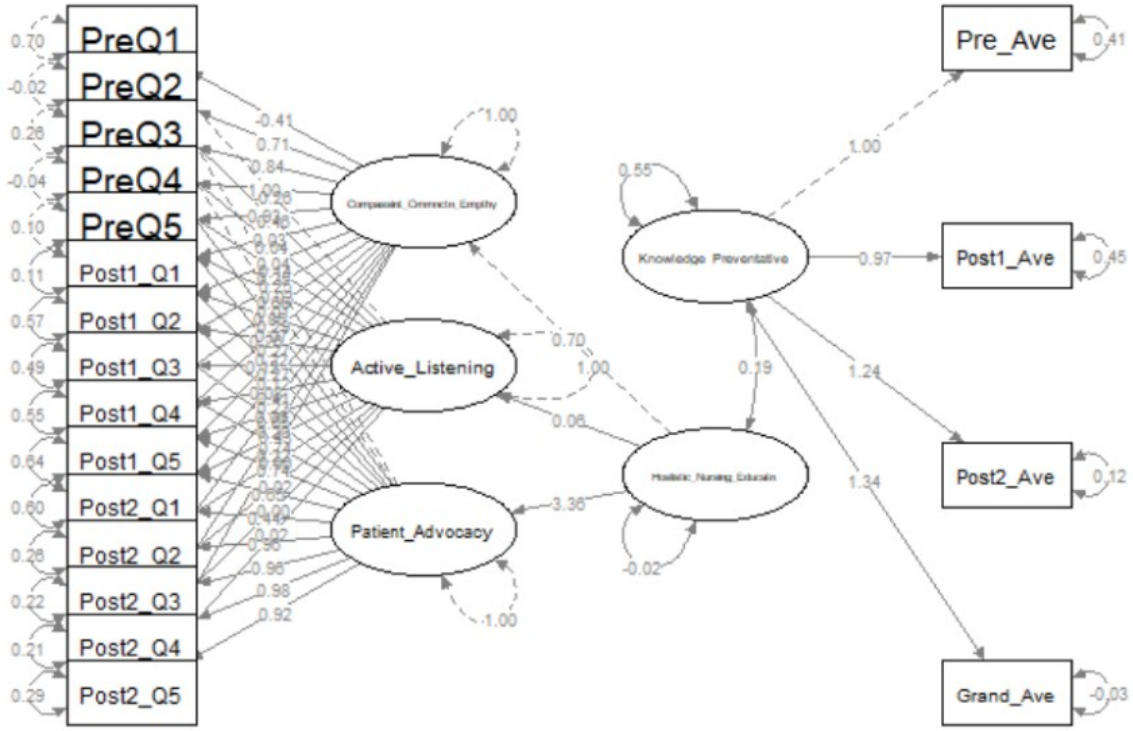
Knowledge Preventative = ~ Pre Ave + Post1 Ave + Post2 Ave + Grand Ave

Equation 3:

Hoslistic Nursing Education = ~ Compassionate Communication Empathy + Active Listening + Patient Advocacy

Figure 1

The User Model (n = 30)



In this model, "**Compassionate Communication Empathy**," "**Active Listening**," and "**Patient Advocacy**" are considered as factors influencing various aspects of nursing care and education, such as patient interaction and knowledge retention. The equation suggests that higher levels of these latent variables are associated with higher scores on the observed variables, indicating a positive relationship between compassionate communication, active listening, and patient advocacy, and the specific items or indicators measured in the pre- and post-tests.

The second equation indicates that the latent variable "**Knowledge Preventative**" is influenced by observed variables related to pre-test averages, post-test averages, and a grand average. This suggests that the overall knowledge preventative construct is influenced by performance across different assessment points, providing a holistic view of knowledge acquisition and retention.

The third equation suggests that "**Holistic Nursing Education**" is influenced by the latent variables related to "**Compassionate Communication Empathy**," "**Active Listening**," and "**Patient Advocacy**". This implies that a holistic approach to nursing education involves fostering skills and attitudes related to "**Compassionate Communication Empathy**," "**Active Listening**," and "**Patient Advocacy**" among nursing students.

The "**User Model**" (based on theoretical assumptions) exhibited a chi-square test statistic (χ^2) of 45.4 with 116 degrees of freedom, yielding a *p*-value of 1, indicating good fit, while the "**Baseline Model**" (default model without the complexity or explanatory power) showed a significantly higher χ^2 of 1738.4 with 171 degrees of freedom, and a *p*-value of < .001, indicating poor fit. The "**User Model**" demonstrated excellent fit based on Comparative Fit Index (CFI = 1.0), slightly overfitting based on Tucker-Lewis Index (TLI = 1.066), and acceptable Standardized Root Mean Square Residual (SRMR = 0.097) and Root Mean Square Error of Approximation (RMSEA = 0). These results suggest that the "**User Model**" better captures the underlying relationships between variables compared to the "**Baseline Model**".

Mardia's coefficients assess multivariate normality. The skewness coefficient of 115 indicates non-normality, though non-significantly (p = .312). The kurtosis coefficient of 209 suggests departure from expected peakedness, marginally significant with a *z*-score of -1.93 (p = .054). These findings imply deviations from normality, particularly in kurtosis, warranting further investigation.

In Table 2, R^2 values indicate the proportion of variance explained by each variable in the model. Higher R^2 values suggest stronger relationships between the variables and the outcome. Variables like "**PreQ5**" (0.8983), "**Post1 Q1**" (0.8826), "**Post2 Q3**" (0.7686), and "**Post2 Q4**" (0.7795) demonstrate high explanatory power, indicating significant influence on the outcome. Conversely, variables such as "**Compassionate Communication Empathy**" and "**Active Listening**" have very low R^2 values, suggesting they contribute minimally to explaining the variance in the outcome.

Table 2

Coefficient of Determination

Variable	R^2
PreQ1	0.2969
PreQ2	
PreQ3	0.7414
PreQ4	
PreQ5	0.8983
Post1 Q1	0.8826
Post1 Q2	0.4055
Post1 Q3	0.4978
Post1 Q4	0.4357
Post1 Q5	0.3423
Post2 Q1	0.3834
Post2 Q2	0.7325
Post2 Q3	0.7686
Post2 Q4	0.7795
Post2 Q5	0.7019
Pre Ave	0.572
Post1 Ave	0.537
Post2 Ave	0.8748
Grand Ave	
Compassionate Communication Empathy	- 0.0102
Active Listening	-7.37×10^{-5}
Patient Advocacy	-0.3009

Table 3 shows the relationship between latent variables (Compassionate Communication Empathy, Active Listening, and Patient Advocacy) and their observed indicators. For "**Compassionate Communication Empathy**," significant positive associations were found with indicators "**PreQ2**," "**PreQ3**," "**PreQ4**," "**PreQ5**," and "**Post2 Q3**" to "**Post2 Q5**," while negative associations were found with "**PreQ1**," "**Post1 Q1**," "**Post1 Q2**," "**Post1 Q3**," "**Post1 Q5**," "**Post2 Q1**," and "**Post2 Q2**". The latent variable "**Active Listening**" showed significant positive associations with "**PreQ2**," "**PreQ4**," and "**Post1 Q1**" to "**Post2 Q1**," while negative associations were found with "**PreQ1**," "**PreQ3**," "**PreQ5**," "**Post1 Q2**," "**Post1 Q3**," "**Post1 Q4**," "**Post1 Q5**," and "**Post2 Q2**" to "**Post2 Q5**". On the other hand, the latent variable "**Patient Advocacy**" exhibited significant positive associations with "**PreQ2**," "**PreQ3**," "**PreQ4**," "**PreQ5**," "**Post1 Q1**" to "**Post1 Q5**," "**Post2 Q1**" to "**Post2 Q5**," and "**Knowledge Preventative**" with "**Pre Ave**," "**Post1 Ave**," "**Post2 Ave**," "**Grand Ave**".

The covariance between "**Knowledge Preventative**" and "**Holistic Nursing Education**" was 0.1922. This suggests a positive relationship between these two variables wherein as one variable increases, the other tends to increase as well. The standard error (SE) of 0.0407 reflects the precision of the estimate, with a lower value indicating greater precision. The confidence intervals (CI) provide a range within which we are 95% confident that the true covariance lies. In this case, the confidence interval ranges from 0.1124 to 0.2719. The β coefficient of 1.8068 denotes the standardized covariance, which allows for comparison of the strength of the relationship between these variables with others in the model. The *z*-value of 4.724 and *p*-value of < .001 indicate that this covariance estimate is statistically significant, suggesting a meaningful relationship between "**Knowledge Preventative**" and "**Holistic Nursing Education**" within the model.

Table 3

Variables in the Structural Equation Model

				95% Confidence Intervals				
Latent	**Observed**	**Estimate**	**SE**	**Lower**	**Upper**	**β**	**z**	***P***
Compassionate Communicatio	PreQ1	-0.41116	0.1534	-0.71181	-0.1105	-0.40908	-2.6804	.007
Empathy	PreQ2	0.71245	0.1838	0.35217	1.0727	0.70885	3.8758	< .001*
Active Listening	PreQ3	0.84045	0.0732	0.69701	0.9839	0.8362	11.484	< .001*
	PreQ4	1.00088	0.0566	0.8899	1.1119	0.99582	17.6752	< .001*
	PreQ5	0.93474	0.0638	0.80964	1.0598	0.93001	14.6452	< .001*
	Post1 Q1	-0.03112	0.1485	-0.32212	0.2599	-0.03149	-0.2096	.834
	Post1 Q2	0.04004	0.1033	-0.16246	0.2425	0.04052	0.3875	.698
	Post1 Q3	0.25021	0.1611	-0.06559	0.566	0.2532	1.5529	.120
	Post1 Q4	0.00783	0.1217	-0.23073	0.2464	0.00792	0.0643	.949
	Post1 Q5	0.07152	0.127	-0.17737	0.3204	0.07238	0.5632	.573
	Post2 Q1	0.22322	0.1721	-0.11417	0.5606	0.22589	1.2967	.195
	Post2 Q2	0.11713	0.081	-0.04156	0.2758	0.11853	1.4467	.148
	Post2 Q3	0.23069	0.1165	0.00241	0.459	0.23345	1.9806	.048
	Post2 Q4	0.1964	0.1063	-0.012	0.4048	0.19875	1.8471	.065
	Post2 Q5	0.21829	0.1085	0.00566	0.4309	0.2209	2.0122	.044
	PreQ1	-0.26346	0.224	-0.7025	0.1756	-0.26345	-1.1761	.240
	PreQ2	0.46188	0.1745	0.11983	0.8039	0.46186	2.6466	.008
	PreQ3	0.03636	0.0766	-0.11383	0.1866	0.03636	0.4745	.635
	PreQ4	-0.14411	0.0626	-0.26675	-0.0215	-0.1441	-2.3031	.021
	PreQ5	0.02515	0.0759	-	0.1739	0.02515	0.3315	.740

				0.12355				
	Post1 Q1	0.85119	0.2647	0.33234	1.37	0.86571	3.2154	.001
	Post1 Q2	0.25799	0.153	-0.04197	0.5579	0.26239	1.6857	.092
	Post1 Q3	0.12185	0.106	-0.08597	0.3297	0.12393	1.1492	.250
	Post1 Q4	0.07766	0.1008	-0.11989	0.2752	0.07898	0.7705	.441
	Post1 Q5	0.06182	0.0914	-0.11741	0.241	0.06287	0.676	.499
	Post2 Q1	0.4287	0.1482	0.13829	0.7191	0.43602	2.8933	.004
	Post2 Q2	0.00275	0.0775	-0.14911	0.1546	0.0028	0.0355	.972
	Post2 Q3	-0.02027	0.0839	-0.18475	0.1442	-0.02062	-0.2416	.809
	Post2 Q4	-0.00468	0.0874	-0.17606	0.1667	-0.00476	-0.0536	.957
	Post2 Q5	0.02314	0.0654	-0.10501	0.1513	0.02353	0.3539	.723
Patient Advocacy	PreQ1	0.25427	0.1963	-0.13052	0.6391	0.22293	1.2952	.195
	PreQ2	0.68117	0.1879	0.31297	1.0494	0.59721	3.6259	< .001*
	PreQ3	0.28974	0.17	-0.04338	0.6229	0.25402	1.7047	.088
	PreQ4	0.27148	0.1691	-0.05996	0.6029	0.23802	1.6054	.108
	PreQ5	0.27356	0.1666	-0.05296	0.6001	0.23984	1.642	.101
	Post1 Q1	0.41018	0.1684	0.08006	0.7403	0.36577	2.4353	.015
	Post1 Q2	0.65296	0.1955	0.26986	1.0361	0.58227	3.3406	< .001*
	Post1 Q3	0.74192	0.213	0.32437	1.1595	0.6616	3.4825	< .001*
	Post1 Q4	0.73573	0.2504	0.24505	1.2264	0.65607	2.9388	.003
	Post1 Q5	0.65209	0.1675	0.3238	0.9804	0.58149	3.8931	< .001*
	Post2 Q1	0.43994	0.1878	0.07179	0.8081	0.39231	2.3422	.019
	Post2 Q2	0.95794	0.2306	0.50589	1.41	0.85422	4.1534	< .001*
	Post2 Q3	0.96188	0.2062	0.55779	1.366	0.85774	4.6654	< .001*
	Post2 Q4	0.97706	0.2134	0.5589	1.3952	0.87128	4.5796	< .001*
	Post2 Q5	0.91984	0.2352	0.45892	1.3808	0.82025	3.9115	< .001*
Knowledge	Pre Ave	1	0	1	1	0.7563		
Preventative	Post1 Ave	0.96897	0.2216	0.5346	1.4033	0.73283	4.3721	< .001*
	Post2 Ave	1.23666	0.2273	0.79119	1.6821	0.93528	5.441	< .001*
	Grand Ave	1.34179	0.2175	0.91547	1.7681	1.01479	6.1688	< .001*
Hoslistic Nursing	Compassionate	0.70214	0	0.70214	0.7021			
Education	CommunicationEmpathy							
	Active Listening	0.06005	0.2546	-0.43894	0.559		0.2359	.814
	Patient Advocacy	3.36286	0.4767	2.42857	4.2972		7.0546	< .001*

Note. $p \leq .05$ (2-tailed), statistically significant; *$p \leq .001$, statistically highly significant; Confidence Interval, CI; Standardized Regression Coefficients, β

4. Discussion

4.1. CFA

The subscales of "**Compassionate Communication Empathy**," "**Active Listening**," and "**Patient Advocacy**" exhibit varying levels of factor loadings, CR, and AVE, indicating their different strengths in measuring the underlying constructs. Compassionate communication empathy demonstrates a factor loading range of 0.070 to 0.802, CR of 0.383, and AVE of 0.159. Active listening shows factor loadings from 0.604 to 0.792, CR of 0.640, and AVE of 0.264. Patient advocacy has factor loadings between 0.637 and 0.840, CR of 0.667, and AVE of 0.667. These values suggest that active listening exhibits the highest reliability and explanatory power, followed by patient advocacy and compassionate communication empathy.

4.2. SEM

4.2.1. "Compassionate Communication Empathy"

The significant positive correlations with certain indicators underscore the importance of empathetic communication in pain assessments. However, the negative associations with specific items suggest potential areas for refinement, perhaps indicating instances where communication strategies may not fully align with empathetic principles. This insight emphasizes the need for creative educational interventions like digital storytelling, which can enhance compassionate or emphatic communication among nursing students. Howick, J., Moscrop, A., Mebius, A., Fanshawe, T. R., Lewith, G., Bishop, F. L., Mistiaen, P., Roberts, N. W., Dieninytė, E., Hu, X.-Y., Aveyard, P., & Onakpoya, I. J. (2018, July). *Effects of empathic and positive communication in Healthcare Consultations: A systematic review and meta-analysis*. Journal of the Royal Society of Medicine. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6047264/

4.2.2. "Active Listening"

The positive correlations observed with select indicators highlight the integral role of active listening in fostering effective communication about their pains. Nevertheless, the negative associations with certain items imply potential challenges in maintaining active listening behaviors across all contexts. This finding underscores the importance of reinforcing active listening skills among nursing students. Tennant, K. (2023b, September 13). *Active listening*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK442015/

4.2.3. "Patient Advocacy"

The positive associations with numerous indicators affirm the critical role of patient advocacy in ensuring patients' needs are heard. By demonstrating such commitment, nursing students can empower their patients to actively participate in their care (when able). Nsiah, C., Siakwa, M., & Ninnoni, J. P. K. (2019, May 29). *Registered nurses' description of patient advocacy in the clinical setting*. Nursing open. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6650676/

4.2.4. Covariance Analysis

The significant positive covariance between "**Knowledge Preventative**" and "**Holistic Nursing Education**" highlights the interconnectedness of preventative care knowledge and holistic nursing principles. This insight suggests that a comprehensive understanding of preventative care strategies is integral to the implementation of holistic nursing practices. By integrating preventative care education into holistic nursing curricula using digital storytelling, this can better prepare nursing students to address the diverse needs of patients within a holistic framework, ultimately enhancing the quality-of-care delivery. Zamanzadeh, V., Jasemi, M., Valizadeh, L., Keogh, B., & Taleghani, F. (2015). *Effective factors in providing holistic care: A qualitative study*. Indian journal of palliative care. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4441185/

5. Conclusion

Utilizing digital storytelling enhances proficiency in providing compassionate care since a positive relationship was validated between knowledge of preventive health measures and understanding of holistic nursing principles. This supports the potential of digital storytelling as an effective tool for educating nursing students in holistic care practices.

Author Contributions

All authors have read and agreed to the published version of the manuscript.

Funding Sources

This research has not received funds from any agency or institution.

Institutional Review Board Statement

The study was conducted according to Helene Fuld College's research ethics committee.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement
The data presented in this study are available on request from the corresponding author.

Conflicts of Interest
The authors declare no conflict of interest.

Acknowledgment

In addition to expressing their gratitude to everyone who took part in the research, the authors would also like to express their appreciation to Helene Fuld College of Nursing for their assistance and participation. This highlights the joint effort being made to promote nursing education through the introduction of novel techniques.

References

McEwan, M., & Wills, E. M. (2021). *Theoretical basis for nursing* (6th ed.) (ISBN: 9781975175658). Lippincott Williams & Wilkins.

Liao, H. C., Huang, C. Y., & Wang, Y. H. (2022). Development and psychometric testing of a scale measuring caring behaviors for healthcare students and providers. *Medical Education Online*, *27*(1), 2066496. https://doi.org/10.1080/10872981.2022.2066496

Faradillah, A., & Adlina, S. (2021). Validity of critical thinking skills instrument on prospective Mathematics teachers. *Jurnal Penelitian dan Evaluasi Pendidikan, 25*(2), 126-137. http://dx.doi.org/10.21831/pep.v25i2.40662

Li, N., Huang, J., & Feng, Y. (2020). Construction and confirmatory factor analysis of the core cognitive ability index system of ship C^2 system operators. *Plos One, 15*(8), e0237339. https://doi.org/10.1371/journal.pone.0237339

Verdugo-Alonso, M. A., Henao-Lema, C. P., Córdoba-Andrade, L., & Arias González, V. B. (2017). Dimensionality and internal structure of the Colombian version of the INICO-FEAPS quality of life scale. *Journal of Intellectual Disability Research, 61*(12), 1094-1103. https://www.researchgate.net/publication/320326481_Dimensionality_and_internal_structure_of_the_Colombian_version_of_the_INICO-FEAPS_quality_of_life_scale

Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2023). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. *Asia Pacific Journal of Management*, 1-39. https://doi.org/10.1007/s10490-023-09871-y

Nguyen, T. T. P., Truong, G. T. H., Nguyen, H. T. T., Nguyen, C. T. T., Dinh, D. X., & Nguyen, B. T. (2022). An instrument for measuring job satisfaction (VIJS): A validation study for community pharmacists in the context of the COVID-19 pandemic in Vietnam. *PLoS One, 17*(11), e0276918. https://doi.org/10.1371/journal.pone.0276918