

Comparison of Telemedicine to Traditional Face-to-Face Care for Children with Special Health Care Needs (CSHCN): Analysis of Cost, Caring, and Family-Centered Care

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July 2014

Disclosure/Acknowledgements

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- **Florida Department of Health, Children's Medical Services Program**
- **Robert Wood Johnson Executive Nurse Fellows Program**
- **No commercial support or conflict of interests**



Scope of the Problem



- ✓ **2006 National Survey of CSHCN**
 - ✓ **13.9 percent of US children**
 - ✓ **13.4% of children in Florida**
 - ✓ **21.8 percent of households with children include at least one CSHCN**

- ✓ **Families of CSHCN frequently face multiple barriers to care**
 - ✓ **Provider availability and access**
 - ✓ **Financial**
 - ✓ **Insurance**
 - ✓ **Geographic barriers to care**

- ✓ **Access to pediatric specialty care is compounded & greater challenge**
 - ✓ **CSHCN require more frequent routine and urgent health care**
 - ✓ **Rural and medically underserved communities (1/5 of US residents)**
 - ✓ **Fewer pediatric specialty services**
 - ✓ **Services frequently only available at a distance**





Scope of the Problem



✓ Telemedicine

- ✓ Mechanism to improve access to specialty care services to underserved rural communities
- ✓ Increasingly viable solution for access to care issues
- ✓ Financial factors include:
 - ✓ Initial deployment costs
 - ✓ Insurance reimbursement & sustainability
 - ✓ Costs directly dependent on utilization
 - ✓ Higher utilization results in lower costs
- ✓ Research on telemedicine indicates:
 - ✓ Consumer and provider satisfaction
 - ✓ Community perceptions of improved quality of care
 - ✓ Need for further evaluation in regards to perceptions of personal/ human connections, caring environments, and family costs





Purpose



- **To examine cost, caring and family centered care of pediatric specialty services using telemedicine technology compared to traditional face-to-face visits for CSHCN in rural, remote and medically underserved areas of Southeast Florida.**
- **Cost, caring, and family centered care examined from the perspectives of the parents/ guardians of CSHCN.**



Study Questions



- **When pediatric specialty care is delivered utilizing telemedicine as compared to traditional face-to-face care....**
 - **What are the differences in **cost** to parents'/guardians'?**
 - **What are the differences in parents'/guardians' perceptions of the system of care as **caring**?**
 - **What are the differences in parents'/guardians' perceptions of the system of care as **family-centered**?**



Definitions

Children with Special Health Care Needs (CSHCN)

- **Have or are at increased risk for** a chronic physical, developmental, behavioral, or emotional condition
- Require health and related services of a type or amount **beyond that required by children generally**”

(Marcin et al., 2004; McPherson et al., 1998)



- **Parent, guardian, or legally designated caregiver**
 - Individual **primarily responsible** for care of CSHCN
 - **Physically present** with child during clinical visits with the pediatric specialist.





Telemedicine for CSHCN



- ✓ **The provision of health care utilizing an interactive communication system**
 - ✓ **high resolution, interactive videoconference equipment**
 - ✓ **audio and video capabilities**
 - ✓ **diagnostic cameras and clinical assessment equipment**

(Harrison et al., 2006; Karp et al., 2000; Nesbitt et al., 2005; Rasmussen & Hartshorn, 2005)

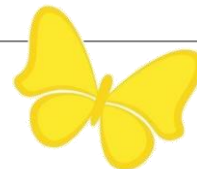
- ✓ **Linking pediatric specialty providers to CSHCN, their families, & local providers in remote, rural, and medically underserved areas**

(Office for the Advancement of Telehealth, 2001; Thurmond et al., 2002)





- **Traditional face-to-face visits** include those clinical visits in which the CSHCN and their parents/guardians are **present in the room physically** with the pediatric specialty provider.
- **Telemedicine visits** include those in which the **specialty provider is at a distant clinical site**
 - Examining and interacting with the CSHCN and their parent/ guardian through the use of **telemedicine equipment**.



- **Cost** is defined in terms of family costs to either attend a remote clinical site or to access pediatric specialty care with telemedicine technology.
 - All inclusive examining both direct and indirect costs



- **Caring** is defined as a nurturing way of relating to a valued other toward whom one feels a personal sense of commitment and responsibility.
 - **Caring = Compassion + Competence** (Swanson, 1991, 2001)





Family Centered Care



Families and professionals **working together in the best interest of the child** with the child assuming a role in this **partnership** as they **grow**;

- Respect of skills & expertise brought to the relationship from both families and professionals
- Trust
- Communication & sharing of information
- Decision making together
- A willingness to negotiate





Summary: Review of the Literature

- Substantiates challenges faced by families of **CSHCN**
- **Cost & Burden:** Challenges compounded when combined with issues such as poverty, lack of insurance, &/ or residing in rural, medically underserved areas
- **Family-Centered Care:** In order to build family-provider partnerships & optimize outcomes for CSHCN, systems of care should strive for and be construed from family perspective as:
 - Accessible
 - Cost Effective
 - Caring
 - Family-Centered
- **Telemedicine** is increasingly being used to improve access to care
 - Lack of research comparing to traditional face-to-face care
 - Need to further investigate as develop systems of care for CSHCN from family perspective examining cost, caring, and family-centered care



Methods



➤ Study Design

- Prospective
- Quasi-experimental

➤ Setting

- Florida Department of Health, Children's Medical Services Program
 - >65,000 CSHCN enrolled statewide as of July 2007
 - Eligibility
 - Clinical= Meets definition of CSHCN
 - Financial= Title XIX, Title XXI, or Safety Net
- Southeast Florida Region (6 counties)
 - > 15,000 CSHCN enrolled as of January 2009
 - Three clinical sites





Methods



- **IRB –**
 - University of Miami
 - Florida Department of Health

- **Sample**
 - Convenience sample (N = 222)
 - Parents or legal guardians of CSHCN enrolled in CMS Florida Southeast Region
 - Pediatric specialty care (traditional and telemedicine) across the region
 - Nutrition & Neurology Clinics
 - Power analysis & estimate of sample size
 - Two Study Groups
 - Traditional Face-to-Face Care ($n = 110$)
 - Telemedicine ($n = 112$)

- **Inclusion & Exclusion Criteria**





Methods: Measurement



➤ #1 Family Cost Survey

- Developed for this research proposal
- Examined family costs related to pediatric specialty visits for their CSHCN
 - Direct (e.g., travel, lodging,..)
 - Indirect (e.g., child care for siblings, loss of wages,..)
- Examined cost for traditional face-to-face care as well as projected costs if telemedicine not available





#2 Caring Professional Scale



- Conceptually & theoretically based on Swanson’s Caring Theory (1991)
- Can be adapted to rate the care provided by a variety of health care professionals measuring caring as an intervention
- Two factor analytically derived subscales
 - *compassionate healer*
 - *competent practitioner*
- 15 items on a 5 point Likert Scale
- Higher scores equate greater caring
- **Reliability**
 - Cronbach’s alpha ranges
 - .74-.96 advanced practice nurses
 - .97 nurses
 - .96 physicians
- **Validity**
 - Correlated with empathy subscale of the Barret-Lennart Relationship Inventory ($r=.61, p< 0.001$) supporting concurrent criterion validity

Caring Professional Scale		
Subscale	Item #'s	Scale Range
Compassionate Healer	1, 5, 6, 7, 8, 12, 13,14	1 – 40
Competent Practitioner	2, 3, 4, 9, 10, 11, 15	1 – 35





#3- Measure of Processes of Care – 20 Item Scale



- Developed from original MPOC- 56 Item Scale
 - Retains the 5 subscales
 - 7-point Likert Scale
 - Higher scores = greater family-centered care
- **Reliability**
 - Internal consistency with α 's ranging from .63 to .92
 - Test – retest reliability yielding interclass correlation coefficients of .81 to .86.
- **Validity**
 - Evidence supports content, face, & construct validity
 - Highly correlated with Larsen Client Satisfaction Questionnaire with r ranging from .4 to .64
 - Inversely correlated with the measures of stress with r ranging from -0.23 to -0.55
 - $p < .05$ to $p < .0001$) across the pilot, field testing and reliability studies

MPOC- 20 Item Scale

Subscale	Item #'s	Scale Range
Enabling & Partnership	4, 7, 8	3- 21
Providing General Information	16, 17, 18, 19, 20	5- 35
Providing Specific Information about the Child	2, 14, 15	3- 21
Coordinated & Comprehensive Care	5, 6, 10, 12	4- 28
Respectful & Supportive Care	1, 3, 9, 11, 13	5- 35





Recruitment & Data Collection



- **Research Team (CITI Certified)**
- **Project Manual/ Training**
- **Recruitment**
 - Letter to potential participants
 - Flyers
 - Onsite
- **Survey Interviews**
 - Review of study including inclusion and exclusion criteria
 - Informed Consent
 - Face- to- Face
 - Survey Completion
 - Review & Participant Letter/ Compensation
 - Follow-up Information
 - Contact
 - Study Results





Data Analysis



- **Univariate Statistics**
 - **Descriptive, Chi Square, and *t* tests**
 - To compare demographics of the two study groups (Telemedicine and Traditional Face-to-Face)
 - Initial examination of outcome variables- cost, caring and family-centered care
 - **Analysis of Variance (ANOVA)**
 - To examine the individual dependent variables (cost, caring and family-centered care) between the two study groups





Parent/ Guardian Characteristics

	Traditional (n = 110)	Telemedicine (n = 112)
	<u>M (SD)</u>	<u>M (SD)</u>
	(n = 102) ^a	(n = 102) ^a
Age^a	40.3 (10.9)	40.0 (12.1)
	No. (%)	No. (%)
Race/ Ethnicity		
White	28 (25.5)	32 (28.6)
Hispanic	18 (25.5)	25 (22.3)
Black	46 (41.8)	49 (43.8)
Asian/ PI	4 (3.6)	2 (1.8)
Gender		
Female	101 (91.8)	98 (87.5)
Male	9 (8.2)	14 (12.5)



Parent/ Guardian Characteristics	Traditional	Telemedicine
	(n = 110)	(n = 112)
	No. (%)	No. (%)
Marital Status		
Married	52 (47.7)	50 (45.0)
Single	36 (33.0)	42 (37.8)
Divorced/ Separated	13 (12.0)	16 (14.4)
Employment		
Full/ Part Time	44 (40.0)	52 (46.4)
Unemployed	34 (34.9)	22 (19.6)
Homemaker	21 (19.1)	25 (22.3)
Education		
Did Not Graduate High School	27 (24.5)	27 (24.3)
High School	41 (37.3)	42 (37.8)
Post Secondary Education	38 (34.5)	36 (32.4)





Characteristics of CSHCN



Characteristics	Traditional <i>M (SD)</i>	Telemedicine <i>M (SD)</i>
Age (in years)	9.8 (5.1)	9.97 (5.4)
Length of time enrolled in CMS (in months)	68.1 (51.1)	60.7 (50.9)
Number of reported health conditions	2.6 (1.9)	2.5 (1.4)
Number of times seen by a specialist at CMS clinic in past year	5.7 (5.4)	6.0 (4.5)
Number of times seen by a specialist using telemedicine in past year	NA	2.7 (1.3)



Characteristics of CSHCN

Traditional
(n = 110)

Telemedicine
(n = 112)

No. (%)

No. (%)

Race/ Ethnicity

White

24 (21.8)

23 (20.5)

Hispanic

29 (26.4)

28 (25.0)

Black

46 (41.8)

54 (48.2)

Asian/ PI

2 (1.8)

0 (0.0)

Health Insurance Coverage

Yes

105 (95.5)

108 (96.4)

Type of Health Coverage

Medicaid/ Title XIX

87 (79.1)

93 (83.8)

Florida Kidcare/ Title XXI

17 (15.5)

14 (12.6)

Safety Net

6 (5.4)

4 (3.6)

Uninsured in Past Year

18 (16.4)

15 (13.5)





Validity & Reliability



- **Caring Professional Scale**
 - Total Scale ($r = .92, p < .001$)
 - Subscales ($r = .86, p < .001$)
 - Consistent with previous studies
- **Measure of Processes of Care – 20 Item Scale (MPOC-20)**
 - Total Scale ($r = .95, p < .001$)
 - Subscales (ranged from $r = .80$ to $r = .92, p < .001$)
 - Improved from previous studies
- **Correlation between CPS and MPOC-20 Scales**
 - Total Scales ($r = .62, p < .001$)
 - Subscales (ranged from $r = .40$ to $r = .68, p < .001$)
 - Scales share underlying construct yet unique differences between caring and family- centeredness





Question #1- What are the differences in **COST** when care is provided via **telemedicine** compared to **traditional** care?



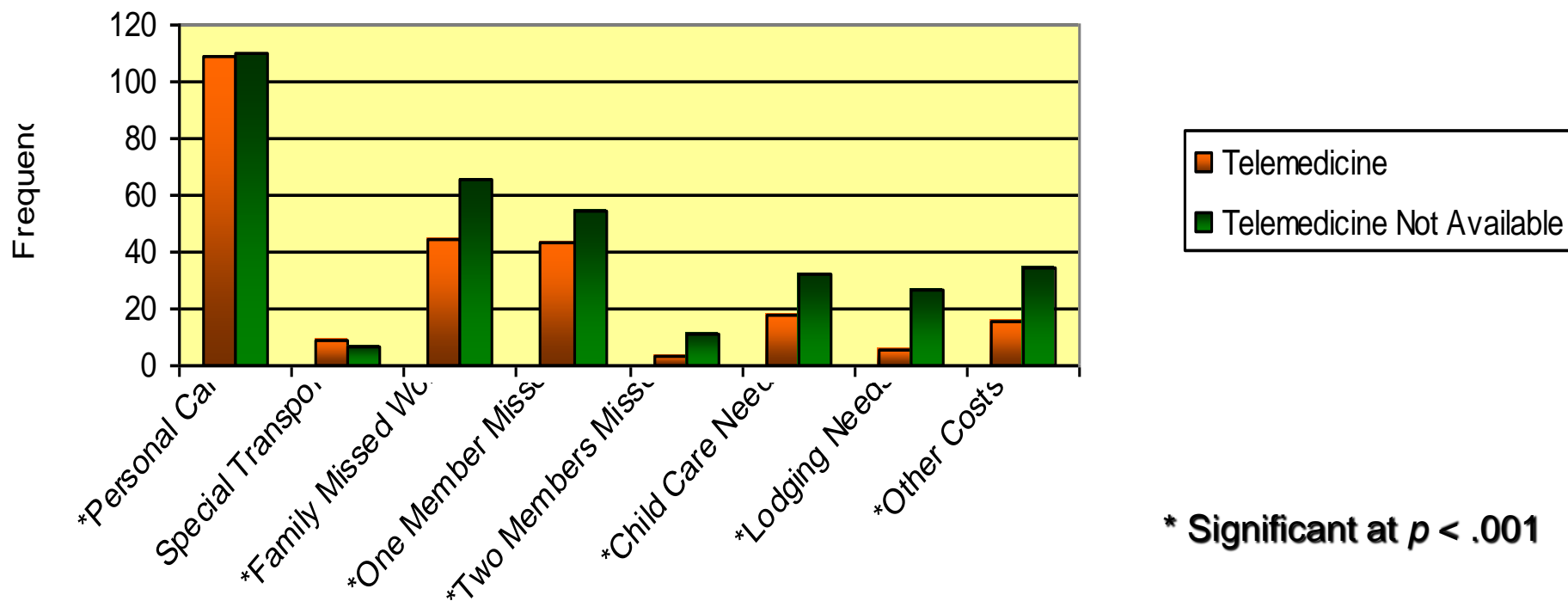
Family Cost/ Impact (per Pediatric Specialty Visit)	Traditional M (SD)	Telemedicine M (SD)
Travel (miles)	33.14 (26.81)	32.25 (28.04)
Travel Cost (dollars)	18.73 (17.19)	17.88 (15.56)
Work Loss (hours)	2.24 (3.30)	2.33 (3.41)
Work/ Wages Loss (dollars)	27.78 (46.52)	28.06 (52.16)
Child Care Costs (dollars)	3.47 (19.70)	3.92 (11.67)
Lodging Costs (dollars)	1.02 (4.77)	1.99 (14.56)
Other Costs (dollars)	2.16 (6.87)	2.15 (7.72)
TOTAL Family Costs (dollars)	53.10 (58.62)	54.15 (67.63)



Question #1- What are the differences in **COST** when care is provided via telemedicine compared to traditional care?

Telemedicine vs. Telemedicine Not Available

Family Cost Comparison per Visit
Family Impact




Question #1- What are the differences in **COST** when care is provided via telemedicine compared to traditional care?

Telemedicine vs. Telemedicine Not Available

Family Cost/ Impact
(per Pediatric Specialty Visit)

Telemedicine
M (SD)

Telemedicine
Not Available
M (SD)

Travel (miles) *	32.25 (28.04)	155.45 (76.72)
Travel Cost (dollars)*	17.88 (15.56)	90.28 (47.96)
Work Loss (hours)*	2.33 (3.41)	5.30 (5.45)
Work/ Wages Loss (dollars)*	28.06 (52.16)	69.48 (110.20)
Child Care Costs (dollars)*	3.92 (11.67)	8.73 (18.23)
Lodging Costs (dollars)*	1.99 (14.56)	19.51 (48.35)
Other Costs (dollars)*	2.15 (7.72)	10.01 (22.03)
 TOTAL Family Costs (dollars)*	54.15 (67.63)	197.24 (159.42)

*Significant at p < .001



Question #2 – Caring

Comparison of Traditional vs. Telemedicine on Parental Perceptions of Provider Caring

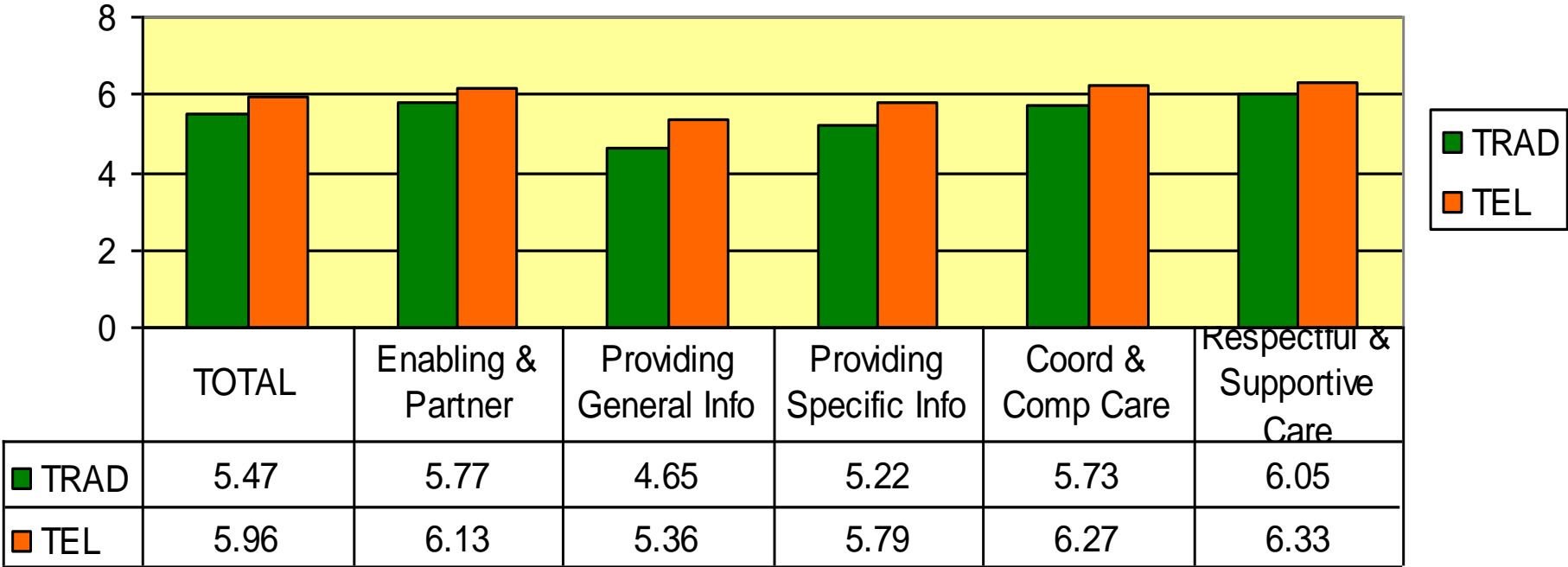
Caring Measure	<i>M (SD)</i>	<i>F</i>	<i>p</i>
Caring Professional Scale (CPS)			
Caring Total Score		1.313	.253
Traditional	69.33 (8.08)		
Telemedicine	70.51 (7.21)		
Compassionate Healer		1.086	.298
Traditional	36.44 (5.2)		
Telemedicine	37.12 (4.43)		
Competent Practitioner		1.457	.229
Traditional	32.86 (3.38)		
Telemedicine	33.39 (3.15)		



Question #3- What are the differences in parents/ guardians perceptions of the system of care as **FAMILY – CENTERED CARE** when care is delivered utilizing telemedicine compared to traditional face-to-face care?



**Family - Centered Care
Measure of Processes of Care 20 Item Scale- Mean Scores**





Discussion of Findings

Study Limitations



- **Convenience Sample**
 - Families \leq 200% of Federal Poverty Level
 - 79% Minority
 - Inclusion limited to those able to read and speak English
- **Family Questionnaire Booklet**
 - CPS and MPOC-12 Item Scales tested/ utilized primarily with non-minority and middle class economic backgrounds
 - Cost Survey questions were not pilot tested prior to the survey
- **Principal Investigator**
 - Employed at CMS in administrative position
 - Disclosure
 - Research Assistant (Ft. Lauderdale & West Palm Beach)



Discussion of Findings Implications of the Study



✓ Telemedicine for CSHCN

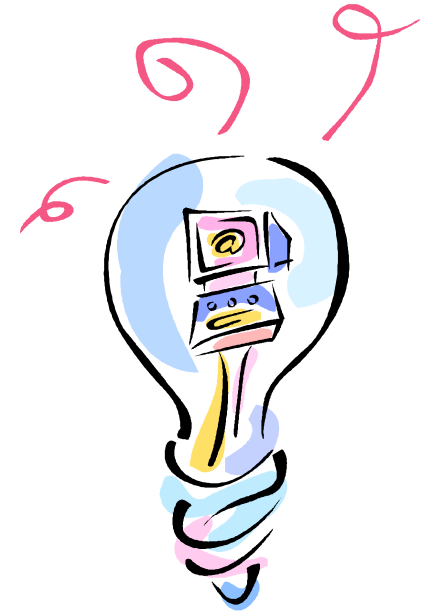
- ✓ Viable + amenable option
- ✓ Access to pediatric specialty care
- ✓ Caring
- ✓ Family-centered
- ✓ Reduces financial burden & hardships

✓ Education

- ✓ Curriculum development
- ✓ Clinical experience
- ✓ Target all health care professionals

✓ Policy and Practice

- ✓ Policy Development... breaking down the barriers
- ✓ Protocols & Standards
- ✓ Workforce Development
- ✓ Innovative Program Planning... nursing, virtual clinics, multi-appointments/ 'one stop shop' experience, bring the clinics to the child/ family/ elderly...
- ✓ Next step technology
- ✓ Beyond rural to metro... think broader scope





Discussion of Findings

Recommendations for Future Research

- **Examine Telemedicine and the Human Connection**
 - How and why the dynamics & specifics of the telemedicine visits impact family perceptions in positive direction
 - Role and presence of nursing
 - ‘Intentional Presence’
 - Develop interventions to promote consistent, positive caring, and family-centered environments across systems of care
- **Measurement Tools**
 - Further testing of CPS and MPOC-12 Item Scales
 - Diverse populations
 - Translation
 - Replicate study with different populations from different backgrounds, regions of the country, or internationally
 - Further testing of Family Cost Survey





Summary



Debunking the Myth..... Providing Evidence

- **Telemedicine can and does:**
 - ✓ Reduce family cost burdens and hardship
 - ✓ Maintain caring behaviors on the part of health care professionals
 - ✓ Promote caring, family – centered systems of care in local communities
 - ✓ Facilitate access to much needed specialty care for vulnerable populations such as CSHCN
- ✓ **Human Connection is not lost through the use of technology**
- ✓ **Expansion of the use of telemedicine across health care systems and communities... breaking down the barriers... moving on...**



Questions

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