



### Abstract

**Purpose:** The purpose of this study is to describe children’s dental disease status and functional health literacy of families enrolled in the Child Health Investment Partnership program in Roanoke Valley. **Methods:** This was a prospective cohort study of children (n=166) enrolled in the Child Health Investment Partnership of Roanoke Valley, Virginia (CHIP). The parents of the 166 children completed the Life Skills Progression (LSP) survey at enrollment between September 2004 and September 2008 to assess their functional health literacy levels. Their LSP scores were used to determine their subsequent health care literacy (HCL), personal health literacy (PHL), and dental-child utilization (LSP22) scores. Descriptive statistics were recorded and a paired t-test was used to determine a relationship between the three measures of functional health literacy at baseline and at their most recent literacy assessment. Dental disease status was determined by an epidemiological dental exam and evaluated using d1d2-3f criteria. This was a visual exam that measured the presence of frank (d2-3) and non-cavitated carious lesions (d1), as well as filled teeth. **Results:** Descriptive analysis of the cohort reveals: 58% of the children enrolled had no carious teeth at the dental screening exam. The average mean of LSP scores for all three scales: HCL, PHL, and LSP22 were significantly different from baseline: p<.0001, p<.0009, and p<.0001, respectively. **Conclusion:** An improvement of parental functional health literacy has been documented in a low-income pediatric dental population when preventative efforts and education is delivered within the context of a home-visitation health program. The population of high-risk children had low levels of dental disease.

### Background

Dental caries is the most prevalent chronic disease of childhood. Significant disparities in oral health exist according to race, ethnicity, education, income and geography. Children from low-income families experience more dental disease and have reduced access to dental care resulting in fewer opportunities for prevention and higher levels of unmet dental treatment needs. Health literacy is thought to be an important determinant of oral health that intersects with other factors (e.g., family attitudes, motivation) in numerous ways. A unique tool that is used to measure functional health literacy is the Life Skills Progression Outcome tool. The Life Skills Progression (LSP) outcome tool goes beyond parental literacy and health outcomes and examines individual parent infant / toddler outcomes over time. It is a utilization-focused outcome evaluation tool for high-risk families with young children. It has been used in home health visitation programs and allows the provider to evaluate data from visits, screening tools, and observations. As a whole the LSP consists of 43 scales that measure different constructs. These constructs are life skills that reflect a variety of basic skills needed to live and parent well. This measurement tool is a useful summary of the functional health literacy in parents of young children. The LSP tool is being used by Child Health Investment Partnership of Roanoke Valley (CHIP of RV). CHIP is a private-public funded home visitation program that provides social services and care coordination for at-risk children and their families.

CHIP promotes the health of children in Roanoke, Botetourt and Craig counties from birth to entry into kindergarten, and who reside in families with income 185-200% below the poverty level of the service area. In addition to educational support, community health nurses and CHIP’s pediatric nurse practitioners are applying semi-annual fluoride dental varnish to the teeth of CHIP-enrolled children between the ages of 6 months and 36 months who do not presently receive varnish treatments through another health care provider. Fluoride varnishes are applied by brush or cotton tip applicator directly to the teeth and take between 1-4 minutes. Varnish treatments serve as vital preventative oral health care for the many children at-risk for significant early tooth decay.

### Methods

- This was a prospective cohort study of children (n=166) enrolled in the Child Health Investment Partnership of Virginia (CHIP).
- Secondary data analysis of enrollment data and clinical records of individual children enrolled in CHIP between September 2003 and November 2009.
- The Life Skills Progression Instrument was administered to the parent/caregiver at enrollment into CHIP.
- Dental caries was evaluated using the d1d2-3f criteria. This was a visual exam that recorded both frank(d2-3) and non-cavitated (d1) carious lesions, as well as filled lesions in the teeth.

- Descriptive analysis described as functional health literacy measures were:
  - Health Care Literacy (HCL)
  - Personal Health Literacy (PHL)
  - LSP 22

### Analysis

- A descriptive analysis was also completed for a number of factors related to health literacy and dental disease status such as:
  - the child’s asthma history; very low birth weight, low birth weight, or normal birth weight; race, gender, age in months at enrollment, length of enrollment in CHIP, parents education level, type of insurance, and locality in which child resides: Roanoke City, Craig County, Roanoke County, or Salem City.
- Paired t-test was used to test the difference in mean health literacy scores at baseline versus those obtained at the most recent home-health visit.

### Results

Descriptors		%	Frequency	% w/decay	N w/decay
Gender	Male	58.43	97	41.11	37
	Female	41.57	69	42.11	32
Race	Black	23.49	39	38.24	26
	White	40.96	44	43.59	17
	Hispanic	26.51	44	52.27	23
	Other	9.04	15	20	3
Asthma	No	93.37	155	63.64	7
	Yes	6.63	11	40	62
Locality	Botetourt County	0	0	0	0
	Craig County	0.6	1	0	0
	Roanoke City	76.51	127	42.52	54
	Roanoke County	14.46	24	50	12
	Salem City	8.43	14	21.43	3
Birthweight	Normal weight	88.7	102	39.22	40
	Low (<2500gm)	6.96	8	37.5	3
	Very Low (<1500gm)	4.35	5	20	1
Parent's Education*	<HS Diploma or GED	52	78	52.56	78
	HS Diploma or GED	40.00	40.00	35.00	60
	>HS Diploma or GED	8.00	8.00	16.67	12
Insurance	Medicaid	93.98	156	41.67	65
	Private	2.41	4	50.00	2
	none	3.61	6	33.33	2
	N	MEAN	SD	MIN	MAX
Age at enrollment	162	2.97	2.27	0.099	6.637
Age at last screening (months)	111	31.51	16.88	5.093	75.139
Number of screenings	120	1.375	0.745	0	3
	N	%			
Existence of Dental Decay	Yes	69	41.57		
	No	97	58.43		

Table 1: Demographic Characteristics

Health Literacy Scores	Initial Mean Score		Most Recent Mean Score		Paired t-test comparing initial and most recent mean scores.			
	Mean	SD	Mean	SD	Est. SD	95%CI	t (df)	p-value
LSP22 (Dental Health)	1.51	1.85	2.61	2.04	1.09	1.99 [0.78,1.40]	7.01(164)	<0.0001
HCL	3.79	0.62	3.90	0.56	0.12	0.45 [0.05,0.19]	3.38(155)	<0.0009
PHL	4.00	0.53	4.14	0.58	0.13	0.38 [0.07,0.18]	4.32(157)	<0.0001

Table 2: Comparison of Functional Healthy Literacy Means at Baseline and Last Visit

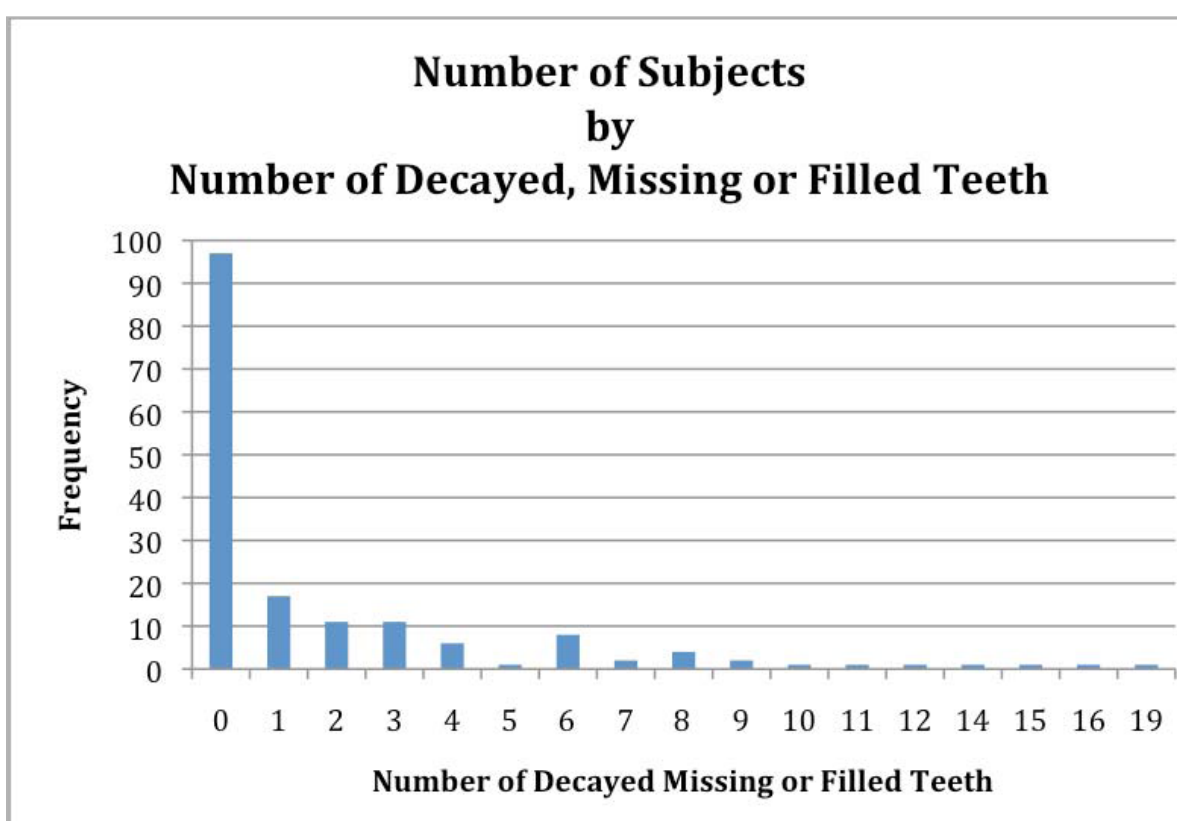


Figure 1: Quartile Ranges for DMFT

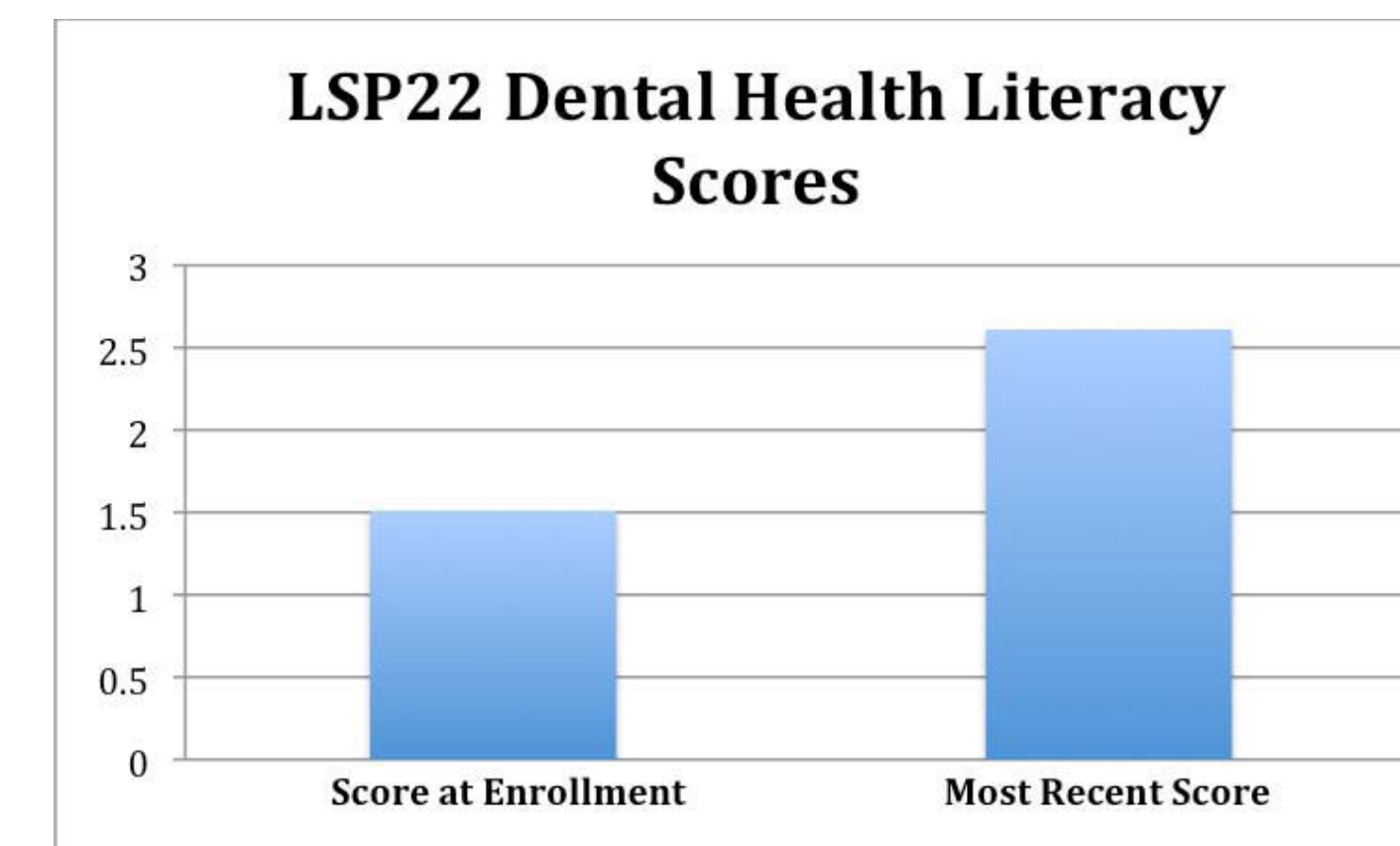


Figure 2: Difference in LSP22 score at enrollment versus most recent score

- Dental caries was only found in 41% of the children (Table 1)
- Caregivers’ mean LSP22 score at enrollment was 1.51 and mean LSP22 score at the last exam was found to be 2.61. The difference was found to be statistically significant (Table 2, Figure 2)
- More than 100 of the 166 children included in this study had only one decayed, missing, or filled tooth or less at their most recent exam visit (Figure 1)
- The median inter-quartile range for the number of decayed, missing, or filled teeth in the CHIP population are 0 and 0 to 2.25, respectively (Figure 1)

### Conclusions

The aim of this study is to describe the dental disease status of a population of children enrolled in the Child Health Investment Partnership (CHIP) program of Roanoke Valley, VA. The LSP tool was developed with the intention of measuring functional health literacy over time. Preliminary findings indicate that functional health literacy improved over time with a home visitation program. This study demonstrates,

- a low decay rate in a high-risk pediatric population,
- a significant association between the differences in functional health literacy measures at baseline and most recent exam, and
- functional health literacy is improved when education is provided within the context of a home-visitation program.

### Acknowledgements

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