Health Literacy and Child Health

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Exploring Health Literacy and Child Health

- Background
- Measurement
- Health Outcomes: Review of the Literature
- Studied Interventions: Review of the Literature
- Future Directions for Research

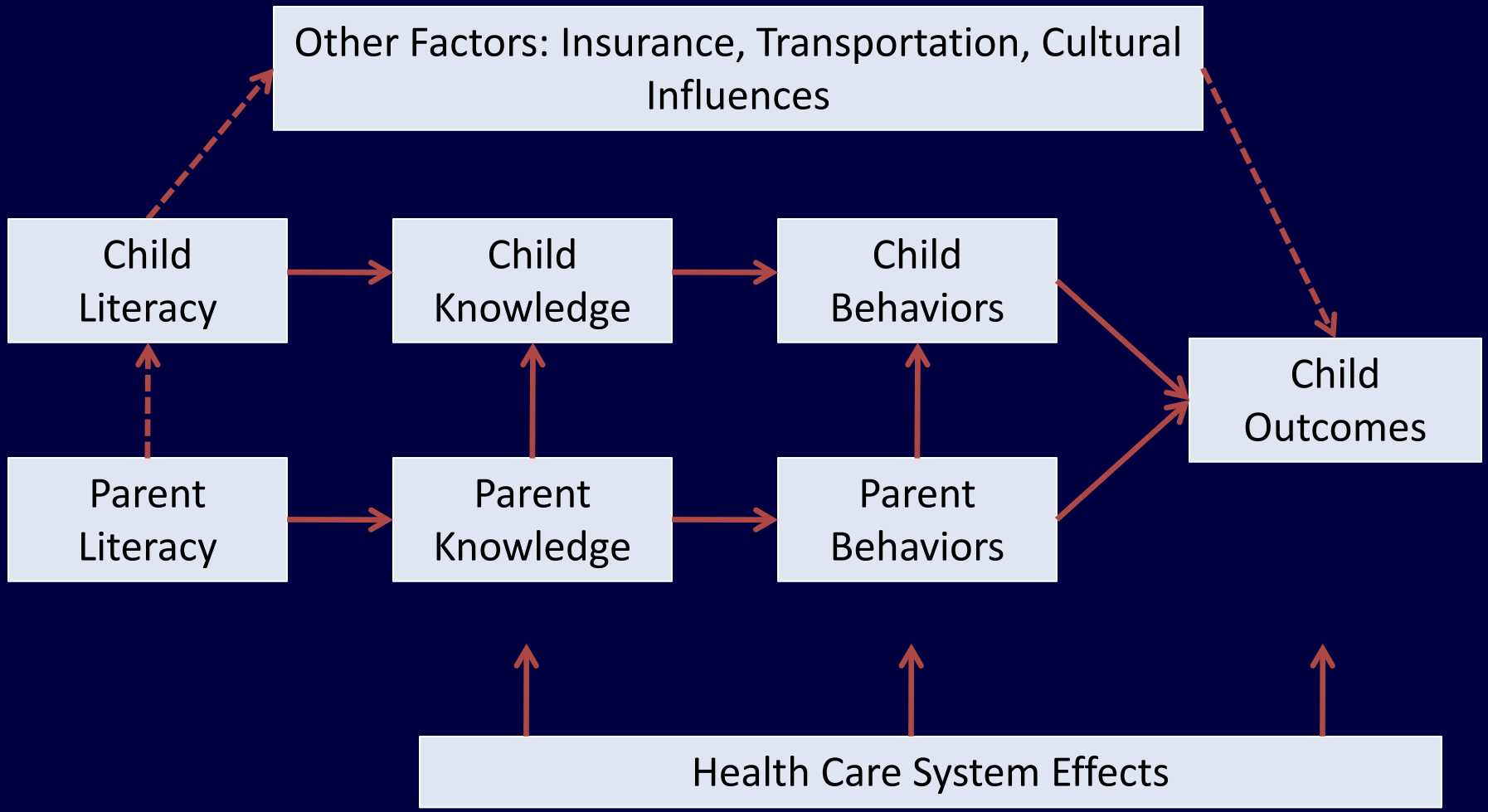
What is Health Literacy?

"The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions."

-Healthy People 2010

- This concept may not accurately define health literacy in the pediatric population
- We are limited to what the literature has explored

Working Relationship Between Literacy and Child Health Outcomes



Methodological Challenge: Dyadic Roles of Parent and Child

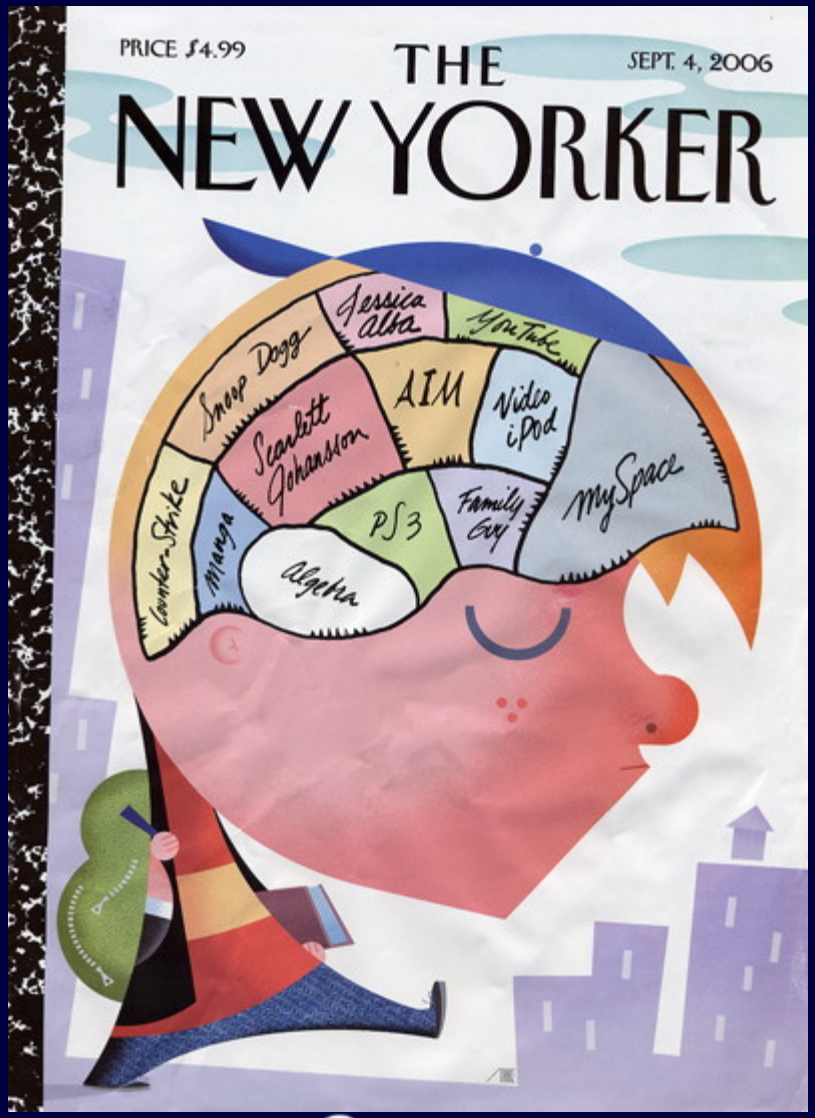
- Which is more influential: child or parental literacy?
- Factors to Consider:
  - Literacy vs. health literacy
  - Child development
    - Intellectual, cognitive, physical
  - The illness or behavior under consideration
  - Transition of self-care activities
    - Often between 11 and 15
    - Complex interaction of factors…

Transition Factors

- Family
  - Organization and Support
  - Maternal Self-Efficacy
  - Perception of Child Capacity
- Child
  - Maturity and Self-Concept
  - Initiation of self-care
  - Academic Achievement
  - Involvement in Outside Activities
- Health and Care
  - Duration of Disease
  - Shared Decision-making with Medical Provider

Transition: Deception of Age

- Age, education level, and possibly literacy can be deceiving…
- Teens sometimes *regress* in their self-care
- Factors other than literacy may be more salient among teens…..

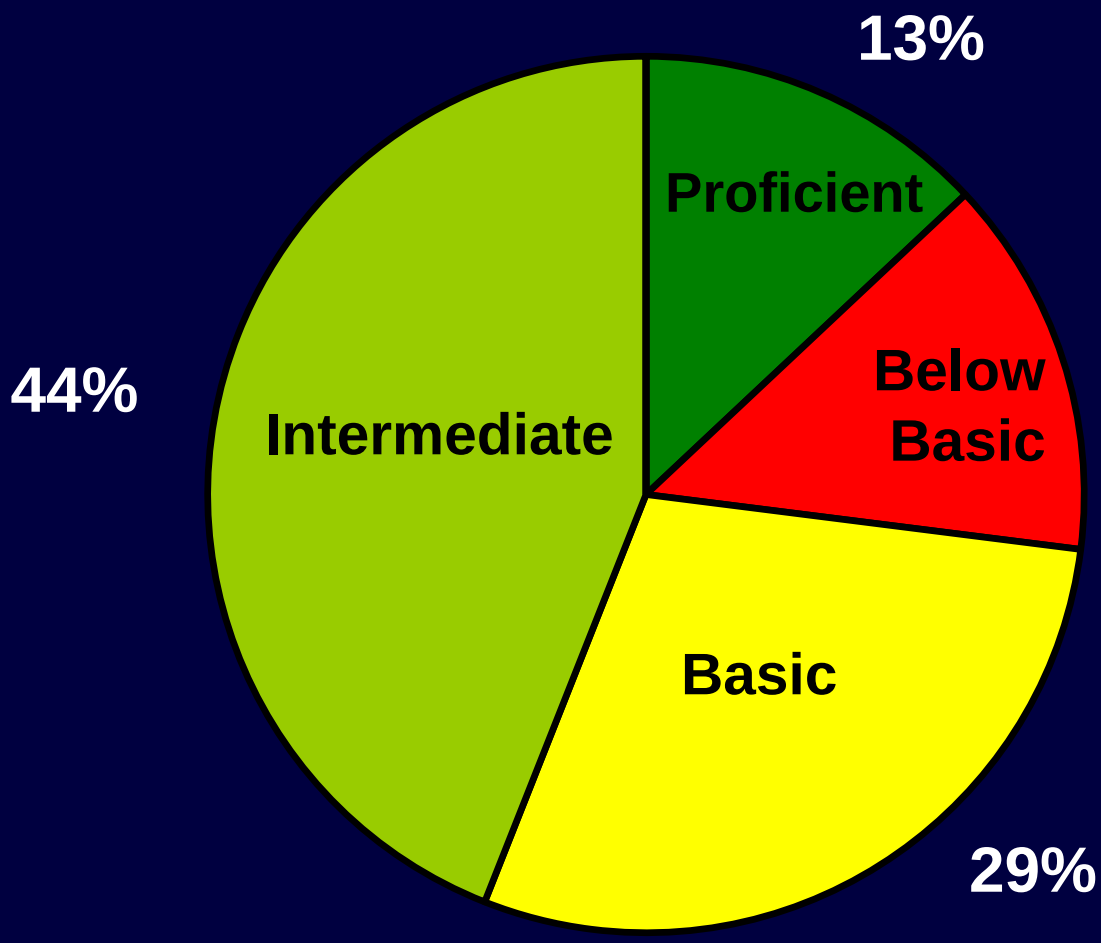


The Current State of Adult Literacy

- 2003: National Assessment of Adult Literacy (NAAL)
  - N=19,714
- Scored on 4 levels
- Levels 1 and 2 cannot
  - Use a bus schedule or bar graph
  - Explain difference in two types of employee benefits
  - Write a simple letter explaining a bill error

National Center for Educational Statistics, U.S. Department of Education

2003 National Assessment of Adult Literacy



Basic or Below Basic

52% of H.S. Grads

61% of Adults ≥ 65

93 Million Adults have Basic or Below Basic Literacy

Adult Outcomes Associated with Literacy

Health Outcomes/Health Services

- General health status
- Hospitalization
- Prostate cancer stage
- Depression
- Asthma
- Diabetes control
- HIV control
- Mammography
- Pap smear
- Pneumococcal immunization
- Influenza immunization
- STD screening
- Cost

Behaviors Only

- Substance abuse
- Breastfeeding
- Behavioral problems
- Adherence to medication
- Smoking

Knowledge Only

- Birth control knowledge
- Cervical cancer screening
- Emergency department instructions
- Asthma knowledge
- Hypertension knowledge

DeWalt, et al. JGIM 2004;19:1228-1239

Measuring Literacy in Health Research: Adults

- Literacy vs. health literacy
- Adults
  - Wide Range Achievement Test (WRAT): word recognition
  - Rapid Estimate of Adult Literacy in Medicine (REALM): medical word recognition
  - Test of Functional Health Literacy in Adults (TOFHLA): health information comprehension and numeracy
    - Short version available

Measuring Literacy in Health Research: Children

- REALM-Teen: medical word recognition test for adolescents and teens
- TOFHLA for teens: health information comprehension and numeracy for teens
    - Both achieved high internal reliability, construct validity and correlation with other tests
    - Need further testing, not widely used
- Most pediatric health studies use basic literacy tests to measure literacy

Davis et al. Pediatrics, 2006
Chisolm et al. J Adolescent Health, 2007

Health Literacy and Child Health: The Need for Further Inquiry

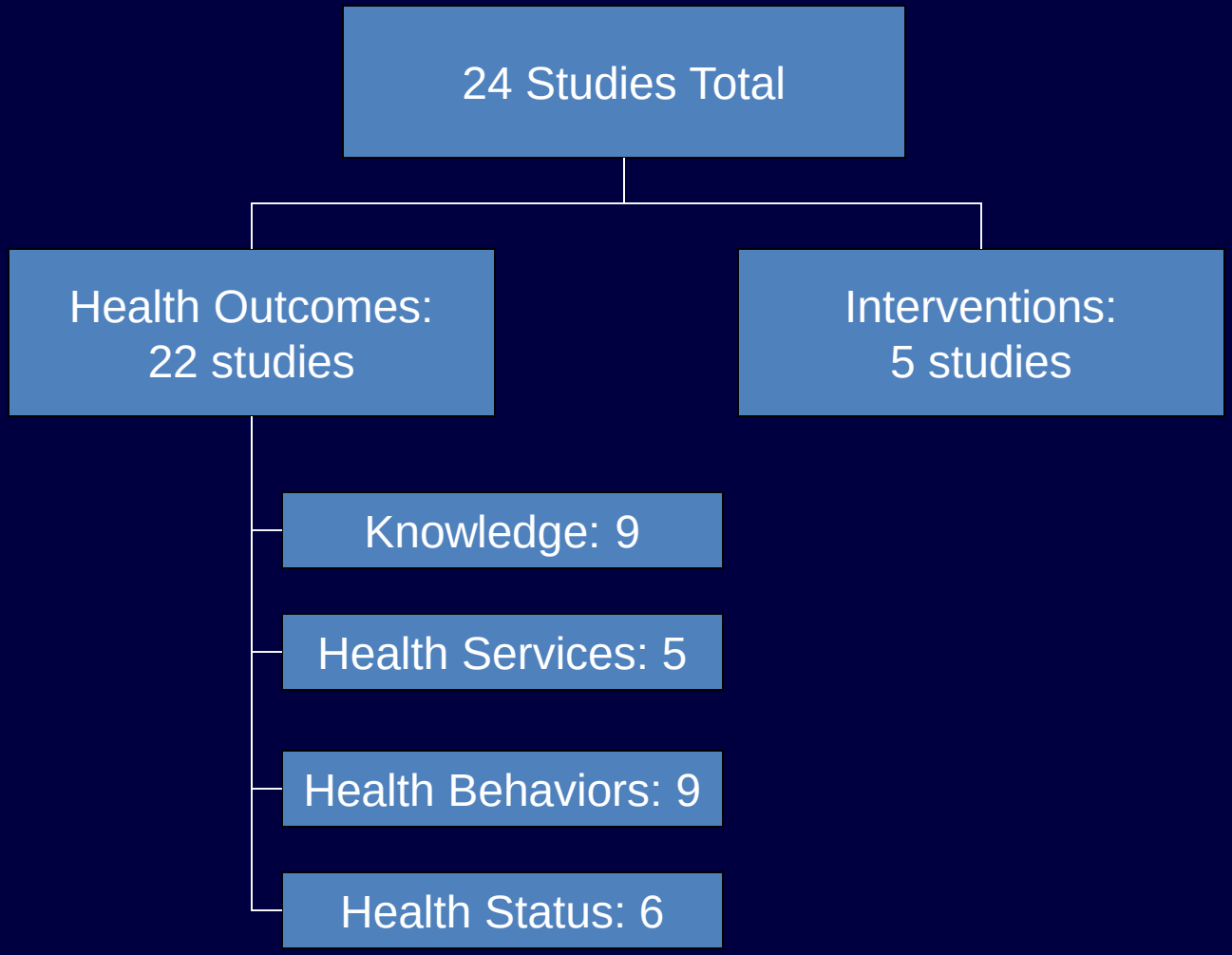
- Previous systematic review
  - 11 pediatric studies from 1980 to 2003
  - Limited understanding of association between literacy and child health
- Association more established among adults
- Need for greater understanding about child health outcomes and effective interventions

DeWalt et al., JGIM. 2004.

Review of the Literature

- Inclusion Criteria:
  - Published after 1980 in English
  - Conducted in developed country
  - Use of controlled or uncontrolled experimental design for intervention studies
  - More than 10 subjects
  - Direct measure of literacy among parents or child
  - Measure of effect on at least one health outcome

Results


24 Studies Total
Health Outcomes:
22 studies
Interventions:
5 studies
Knowledge: 9
Health Services: 5
Health Behaviors: 9
Health Status: 6

Health Outcomes

- 22 Studies
- Study characteristics
  - Most cross-sectional or longitudinal cohorts
  - Sample size 30 – 3019
  - Literacy measurement:
    - Adult literacy: 15
    - Child literacy: 6
    - Both: 1
  - REALM and TOFHLA used most

LL worse off

Family Planning
- Prenatal screening
- Oral contraceptive pills

Prevention and chronic care
- Immunizations
- Asthma knowledge
- Liquid medication dosing

Services Knowledge
- Consent forms

No Literacy Relationship

- Health services needed

Knowledge

Overview:

- 9 studies, 7 health topics
- In all but 1 study, LL associated with less knowledge / comprehension

Health Services

LL worse off

Asthma hospitalizations

No Literacy Relationship

All cause hospitalization
Total health service use

LL better off

Patient perceived quality of communication

- 4 Studies
- All measure parental literacy
- Mixed Findings

Health Behaviors

LL worse off

- Violence
  - Gun carrying
  - "Problem behavior"
- Substance use
  - Tobacco use
  - Smoking among parents
- Breast feeding
- Medication taking
  - LL more barriers
  - Use of non-standard dosing

No Literacy relationship

- Pre-teen EtOH use
- Adherence to oral contraceptives

Overview:

- 9 studies; 5 measured child literacy
- All except 2 studies found that LL was associated with negative health behaviors
- One study found LL associated with tobacco use among boys only

Health Status

LL worse off

- Asthma severity, ED, hospitalization
- Diabetes control
- Depressive symptoms

No relationship

- Migraines
- Dental health

Overview:

- 5 studies; 2 measured child literacy
- 3 studies found LL related to worse health outcome of interest
- Special mention: diabetes study by Ross

Summary of Findings

	Association with Low Literacy	No Association with Low Literacy
Poor Knowledge	Prenatal screening Oral contraceptives Childhood immunizations Asthma Medication dosing Consent forms	Health care services
Health Services	Asthma ED visits and hospitalizations	All-cause admissions Access, use and cost Quality of well-child care (negative association)
Behaviors	Gun carrying and fighting "Problem" behaviors Tobacco use Maternal breast feeding Medication barriers Non-standardized dosing instruments	Adolescent alcohol use OCP adherence
Health Status	Depressive and withdrawn symptoms Asthma severity Poor diabetes control	Migraines Dental health

Interventions

- 5 Studies
- Study characteristics
  - 4 controlled trials, 3 stratified results by literacy level
  - 4 targeted interventions to the parents
  - 4 measured caregiver literacy
  - Outcome variables: knowledge (4), behavior (1), health outcomes (1)
  - Interventions: modified print materials, multi-media, teach-back method, literacy/asthma classes

Interventions: Health-Related Knowledge Outcomes

Target	Intervention	Findings
Polio vaccine knowledge (2 studies)	Polio vaccine pamphlets written below 9th grade and 6th grade reading levels compared to CDC version	Generally better comprehension of revised pamphlets, but not for those with lowest levels of literacy
Research consent comprehension	Consent information for high and low risk studies presented via modified print, video or laptop presentation	Overall better comprehension of modified print version compared to other formats
Liquid medication knowledge	Pictogram medication sheet with brief counseling and teach-back method	Intervention parents had better knowledge about medication and dosing (similar effect size for HL and LL)

Interventions: Health Behaviors and Status Outcomes

Target	Intervention	Results
Liquid medication adherence	Pictogram medication sheet with brief counseling and teach-back method	Intervention parents more likely to correctly dose medicine and adhere to regimen (similar effect size for HL and LL, per author)
Asthma self-efficacy, ED visits and hospitalization	Children with asthma enrolled in weekly literacy and asthma classes for 6 months	Children had improved self-efficacy and fewer ED visits and hospitalizations Those with greater improvements in literacy were least likely to have repeat ED visits

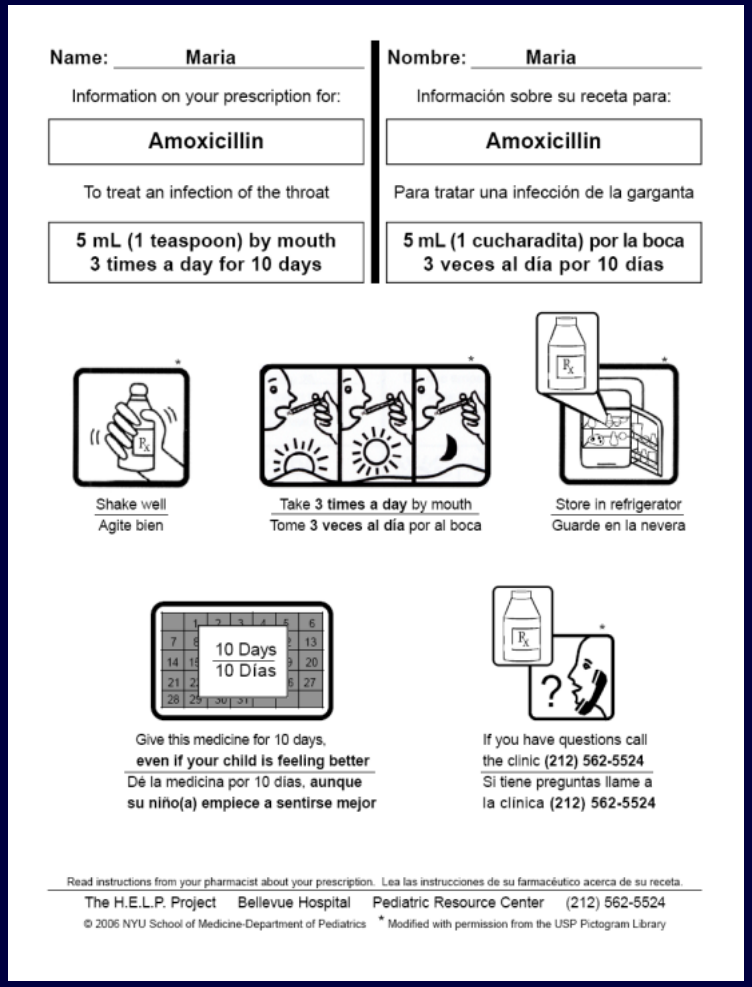
Intervention Example:
Yin et al., 2008

- Objective: To evaluate the efficacy of a pictogram-based intervention to decrease liquid medication errors by caregivers
- Intervention: *Medication counseling with a pictogram-based instruction sheet teach-back method*
- RCT
- 245 caregivers of children 30 days to 8 years-old from public hospital
- Caregiver literacy measured (TOFHLA)
- Outcome measures:
  - Medication knowledge
  - Dosing accuracy
  - Adherence

Yin et al., Arch Ped Adol Med, 2008.

Pictogram Instruction Sheets

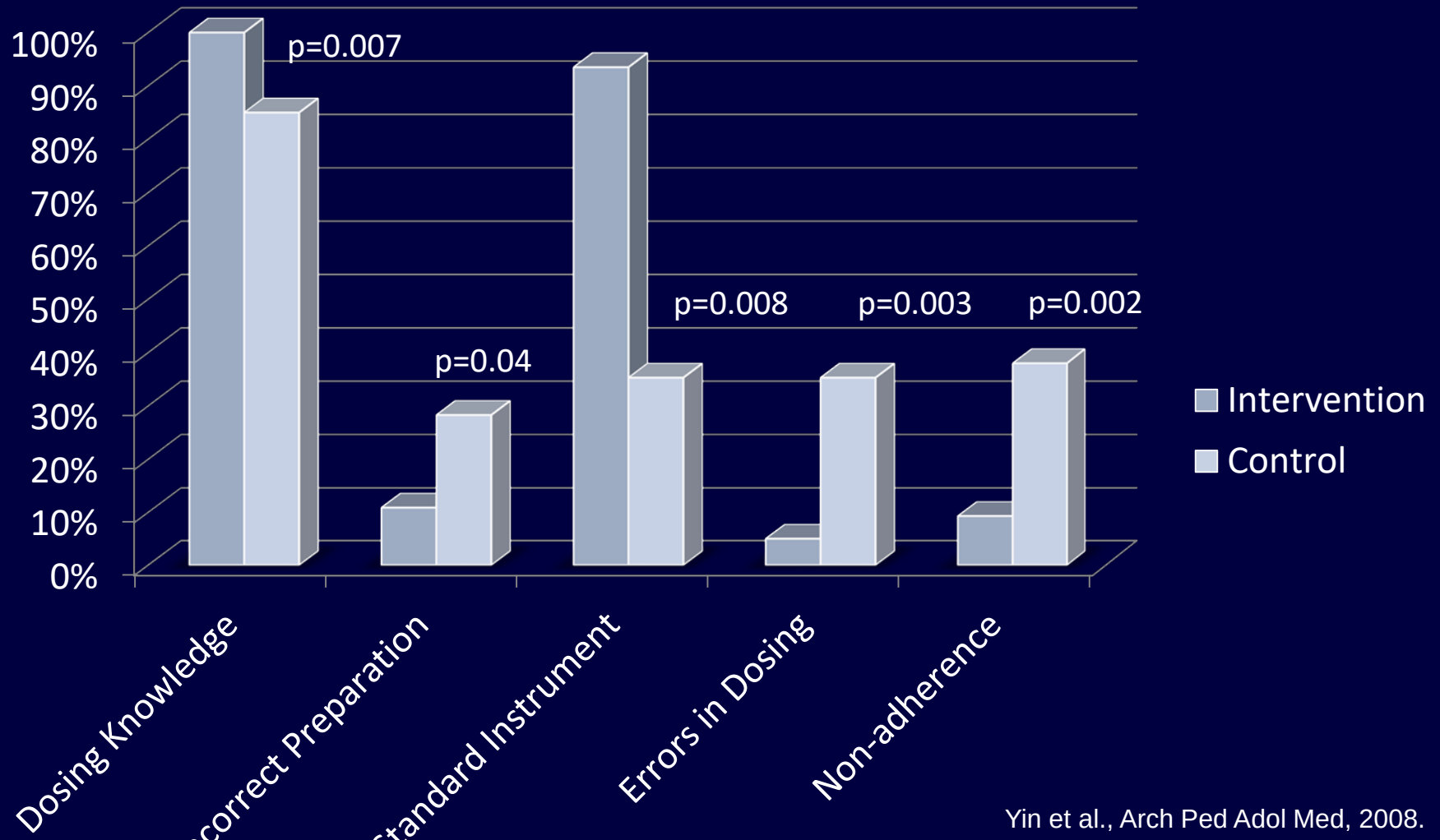
Yin et al., 2008



Yin et al., Arch Ped Adol Med, 2008.

Results

Yin et al., 2008



Yin et al., Arch Ped Adol Med, 2008.

Discussion: Health Outcomes

- Knowledge and behavior most frequently measured outcomes
- Parental low literacy often associated with poor health knowledge and behaviors
- Adolescent low literacy associated with adverse “risk taking” behaviors
- Fewer studies between LL and health-related services and health status, mixed results
  - *Still difficult to draw conclusions about the cause and effect relationship between literacy and child health outcomes*

Discussion: Interventions

- Modified print information most common intervention
- Knowledge most frequently measured outcome
- Interventions generally improved outcomes of interest (knowledge or dosing)
- One intervention looked at actual health outcomes (hospitalization) but not a controlled trial

  – *Opportunities still exist for development of effective interventions for children and their parents*

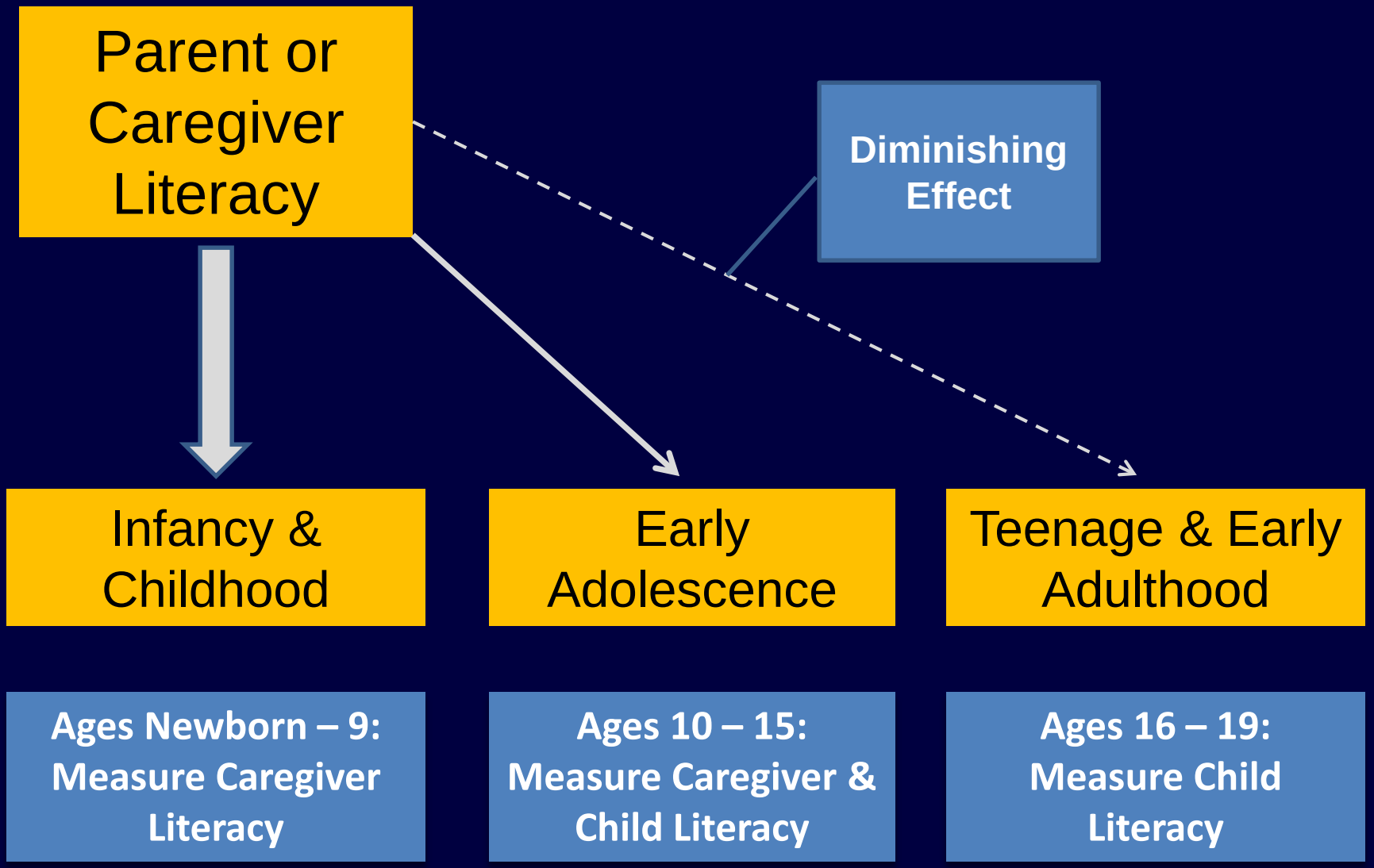
Limitations

- Quality of Literature
  - Most cross-sectional
  - Lack of control for covariates
  - All different, unable to combine data
- Search Methods
  - Excluded those without valid literacy measure, possibly missed effective interventions
- Quality Ratings
  - Approximate

Implications for Future Research

- Focus parental literacy study on younger children to avoid mixed effects
- Present results of interventions with subgroup analysis in those with low literacy
- Identify key health literacy skills children need for transition to self-care
- Explore and understand the roles of caregiver and child literacy

Thinking About Who to Measure



Implications for Future Research

- Focus on behaviors and knowledge questions should directly correspond to behaviors

- Design and study interventions that improve outcomes for all, but especially minimize the health disparities between low and high literacy

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Reviewed Studies

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