

The Relationship Between Parent Health Literacy and Pediatric Emergency Department Utilization: A Systematic Review

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ABSTRACT

BACKGROUND: Low health literacy in parents can potentially impact understanding of a child's diagnosis and treatment course. No reviews have addressed parent health literacy in the emergency department (ED), the relationship between parent health literacy and child ED utilization, or the impact of low literacy interventions on child ED utilization.

OBJECTIVE: To systematically evaluate the peer-reviewed literature pertaining to parental health literacy and ED utilization. The following key questions were addressed: question (Q) 1) What is the prevalence of low health literacy, as estimated by validated health literacy measures, of parents in the ED? Q2) Is parent low health literacy related to ED use for children? Q3) Do low literacy interventions targeting parents likely to have low health literacy affect ED use for children?

DATA SOURCES: The authors reviewed 483 unduplicated titles and abstracts published between 1980 and May 2012 using PubMed and CINAHL, with 117 retained for full review and 17 included in the final analytic review.

STUDY ELIGIBILITY CRITERIA, PARTICIPANTS, AND INTERVENTIONS: All included articles had a valid measure of parent health literacy and a Q1) descriptive measurement of the population, Q2) ED utilization, or Q3) utilized a low literacy educational intervention.

STUDY APPRAISAL AND SYNTHESIS METHODS: One author extracted data verified by a second author. Studies were rated for quality by both authors.

RESULTS: Q1) A median of 30% (interquartile range 22–36%) of parents in the ED possesses low health literacy. Q2) Studies investigating the relationship between health literacy and ED yielded mixed results. Q3) Seven of 8 low literacy interventions were associated with a reduction in ED use. Random effects pooled odds ratios from 6 studies showed intervention effectiveness (odds ratio 0.35; 95% CI 0.15–0.81).

LIMITATIONS: No intervention studies measured health literacy, limiting the ability to determine whether the low literacy intervention targeted health literacy.

CONCLUSIONS AND IMPLICATIONS OF KEY FINDINGS: Roughly 1 in 3 parents of children presenting to the ED have low health literacy. Importantly, interventions targeting parents likely to have low health literacy have an impact in reducing ED utilization.

KEYWORDS: adolescent; child; child, preschool; emergency service; hospital; health literacy; infant; newborn; patient education as topic; utilization

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WHAT THIS SYSTEMATIC REVIEW ADDS

- Roughly 1 in 3 parents in the emergency department with their children have low health literacy.
- Low health literacy may have a relationship with increased emergency department use in children.
- Targeted low literacy interventions can reduce emergency department utilization.

HOW TO USE THIS SYSTEMATIC REVIEW

- Update your knowledge about parents' ability to understand, process, and use health information.
- Use as a catalyst to use health literacy universal precautions in your clinical work.
- Consider the implications of using materials addressing low health literacy in clinical and research interventions for parents.

AN ESTIMATED 90 million Americans have low health literacy, defined as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.”¹ Low health literacy serves as a potential mediator of health disparities, with low socioeconomic status, less than high school education, poor English proficiency, black race, Hispanic ethnicity, older age, and birth outside of the United States found to be risk factors.^{1–3} National organizations, including the Institute of Medicine and the United States Department of Health and Human Services, recognize the detrimental impact of low health literacy, and the Joint Commission has characterized health literacy as an important consideration for patient safety.^{1,4,5}

Although the relationship between health literacy and emergency department (ED) utilization is well established within the adult literature, relatively few studies have evaluated this relationship within the pediatric population. As many as 48% of adult ED patients demonstrate low health literacy,^{6–8} which is associated with worse global measures of health, more adverse health outcomes, and increased ED use and hospitalizations.^{7–10} Considering that low health literacy can affect a patient’s understanding of diagnoses, treatment course, written materials, and follow-up appointments,^{11–14} it is concerning that over 21 million parents in the United States have low health literacy.³ When a child visits the ED, parents’ health literacy skills are crucial in providing the necessary information to guide medical decision making, make informed decisions about treatment, and establish follow-up for the child. Despite its importance, little is known about health literacy of parents who bring children to the ED.

The purpose of this systematic review was to evaluate the peer-reviewed literature pertaining to the health literacy of parents in the pediatric ED and the relationship between parent health literacy and ED utilization for children. In addition, this review assessed the effectiveness of low literacy interventions for parents on childhood ED utilization.

METHODS

SEARCH QUESTIONS

A comprehensive literature search was conducted on the basis of the following questions: Q1) What is the prevalence of low health literacy, as estimated by validated health literacy measures, of parents in the ED? Q2) Is parent low health literacy related to ED use for children? Q3) Do low literacy interventions targeting parents likely to have low health literacy affect ED use for children?

INCLUSION AND EXCLUSION CRITERIA

The literature search was restricted to studies completed between 1980 and May 2012 involving children aged 0 to 18 years and their parents. As ED use may be disparate between countries given health care systems, only studies completed within the United States were targeted. Review

articles were excluded from analysis. For Q1, the search parameters included validated measures of health literacy and/or numeracy that measured characteristics in the ED. For Q2, the search included health literacy measures and ED utilization. For Q3, the search targeted low literacy interventions designed to address ED utilization. Studies were included if they reported numeric data on ED visits for at least 6 months after intervention, or a control group. We defined health literacy interventions as “interventions to improve patients’ and parents’ abilities to use printed materials to improve child health outcomes by targeting low parent health literacy” based on previous authors’ constructs.^{12,15} We chose to focus on interventions that incorporated low literacy printed materials; a definition can be readily established for low literacy materials, whereas other intervention types are difficult to categorize as low literacy. The search revealed insufficient articles for analysis when including only interventions labeled as health literacy interventions. Therefore, this study included interventions that addressed low health literacy in parents by targeting populations at risk for low health literacy (defined as at least 25% living under the poverty level, over 50% Medicaid insurance, or an inner-city population) with a health educational intervention designed for low literacy populations (defined as <9th grade reading level).

LITERATURE SEARCH

PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) were searched for articles pertaining to the key questions noted above as other systematic reviews of this topic have found all articles through these databases.^{12,14} The health literacy measure keywords searched for Q1 and Q2 included: “health literacy,” “literacy,” “educational status,” “reading skill,” “reading ability,” “Rapid Estimate of Adult Literacy,” “REALM,” “Test of Functional Health Literacy in Adults,” “TOHFLA,” “Wide-Range Achievement Test,” “WRAT,” “Newest Vital Sign,” “NVS,” “PHAT,” and “Parent Health Activities Test” as well as MeSH terms “health literacy” and “educational status.” For limiting results to enrollment in the ED, the keyword search for Q1 included: “emergency department,” “emergency ward,” and the MeSH term “emergency service, hospital.” The search for emergency department utilization for Q2 and Q3 included: “utilization,” “use,” “emergency department,” “emergency ward,” and “emergency service, hospital” as well as subheading search for “utilization.” The educational intervention search for Q3 included keywords “health education,” and “patient education” as well as MeSH terms “health education,” “patient education as topic,” and “patient education handout as publication type.” These search terms intentionally allowed for a broad search of both the measurement of health literacy and intervention types. All articles retrieved from the CINAHL search were also present in the PubMed search, and the resulting numbers of articles from the PubMed search are presented. Reference sections from all selected articles and

available review articles were reviewed, and no additional articles were identified. The primary search was developed with the assistance of a medical reference librarian and completed by the first author (AM).

DATA EXTRACTION AND ASSESSMENT OF STUDY VALIDITY

Studies were initially retrieved and evaluated for inclusion by applying the inclusion and exclusion criteria to the title and abstract by the first author (AM). Articles that clearly did not meet the criteria by review of the title and abstract were immediately excluded using explicit inclusion/exclusion criteria. The remaining articles were reviewed for full inclusion by authors AM and MM. If both reviewers agreed that the article did not meet the inclusion criteria, the article was excluded. Disagreements of inclusion/exclusion were handled through consensus. Data found in the tables accompanying this article were abstracted by one author (AM) into a database and verified by a second author (MM). Authors were contacted for missing outcome data.

The quality of the articles was assessed for all 3 questions based on criteria adapted from West and colleagues.¹⁶ This approach has been used in previous systematic reviews of health literacy.^{6,9,12,14} Both reviewers (AM and MM) graded the quality of articles based on 7 criteria (adequacy of study population, comparability of subjects, validity of literacy measurement or educational instrument, maintenance of comparable groups, outcome measurement, statistical analysis, and appropriate control of confounding) scoring 0, 1, or 2 points each. Total scores were categorized as good quality (10–14 points), fair quality (6–9 points), and poor quality (0–5 points).¹⁶ Because not all criteria applied to all studies, a proportional cutoff (0.7, 0.4), equal to the cutoffs above, was applied for studies in which not all criteria were applicable.

DATA ANALYSIS

The prevalence of low health literacy was defined as the number of parents scoring in the inadequate or marginal level of the Test of Functional Health Literacy in Adults (TOFHLA) or the short TOFHLA (S-TOFHLA) or less than 9th grade on the REALM; 95% confidence intervals were calculated using sample size. A chi-square analysis was utilized to assess the heterogeneity, and thus the ability to utilize a pooled estimate of the sample, for the prevalence of low health literacy in parents within the ED. For Q2, the outcome data did not support combined analysis. For Q3, odds ratios (OR) were calculated on the basis of the available results from all included studies. In addition, a DerSimonian and Laird test for heterogeneity, a chi-square test with (K tables – 1) degrees of freedom that assessed the need for a random-effects or fixed effects approach to pooling the OR, was utilized to determine the heterogeneity of the studies. When the heterogeneity was significant, the DerSimonian and Laird random effects method was used to obtain a pooled OR and the appropriate (larger) CI using the appropriate variability (taking into account the heterogeneity) for ED use of interventions tar-

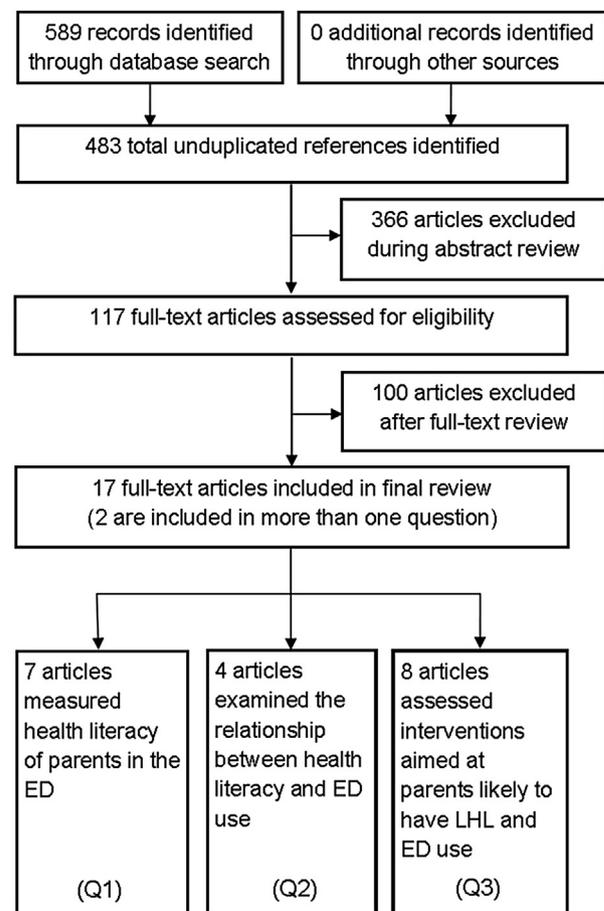


Figure 1. Literature search results flow diagram.

geting populations likely to have low health literacy. Peter's test was performed to test for biased study inclusion. Statistical analyses were performed by Stata software, version 12 (StataCorp, College Station, Tex).

RESULTS

Overall, 483 unduplicated articles were identified through the keyword searches, with 117 full-text articles evaluated for initial eligibility (Fig. 1). A total of 17 articles met the full criteria and were included for review; none were duplicate reports of the same study data. Studies were primarily excluded from full review for Q1 and Q2 as a result of lack of any health literacy measurement and study completion outside of the ED. Articles for Q3 were primarily excluded for lack of a low literacy intervention, for not including ED use as an outcome variable, or for utilizing a patient population not at risk for low health literacy.

PARENT HEALTH LITERACY IN THE PEDIATRIC ED (Q1)

Seven studies, totaling 1043 patients, measured the health literacy of parents in the pediatric ED with a validated health literacy measure (Table 1).^{17–23} Five of the 7 studies were rated as good-quality studies.^{18–20} The REALM (or short version REALM-SF) and TOFHLA (or short version S-TOFHLA) were the most frequently used measures of health literacy. These measures are

Table 1. Study Summary: Estimated Prevalence of LHL (Question 1)

| Study | Year | Instrument/Cut Point | Sampling Strategy | Outcome | Parents in ED With Low Health Literacy | Study Quality |
|--|------|----------------------|------------------------|--|--|---------------|
| Farber ¹⁷ | 1998 | REALM/9th grade | Sequential enrollment | Characteristics of young patients with asthma in the ED, including parent LHL | 48.8% | Fair |
| Macy ¹⁸ | 2011 | REALM/9th grade | Convenience sample | Relationship between LHL and asthma knowledge, ED use after intervention | 31.4% | Good |
| Rosman ¹⁹ | 2012 | REALM-SF/9th grade | Convenience sample | Relationship between parent characteristics (including LHL) and prescription filling | 30.8% | Good |
| Sanders ²⁰ | 2007 | S-TOFHLA/IMA | Cross-sectional sample | Relationship between LHL and cost of care and use of health care services | 22.8% | Good |
| Tran ²¹ | 2008 | S-TOFHLA/IMA | Convenience sample | Prevalence of LHL | 10.5% | Poor |
| Trifiletti ²² | 2006 | REALM/9th grade | Convenience sample | Development of injury prevention materials for LHL population | 36.6% | Good |
| Yin ²³ | 2007 | TOFHLA/IMA | Cross-sectional sample | Relationship between LHL and ability to dose medication | 25.6% | Good |
| Median (IQR) estimate of parent low health literacy of all studies | | | | | 30 (22–36%) | |

LHL = low health literacy (inadequate, marginal, or <9th grade); ED = emergency department; REALM = Rapid Estimate of Adult Literacy in Medicine; (S-)TOFHLA = (Short) Test of Functional Health Literacy in Adults; REALM-SF = REALM—Short Form; IMA = inadequate, marginal, adequate health literacy; IQR = interquartile range.

available in English and Spanish, and they are thought to measure the construct of print literacy in a health care setting.^{24,25} The studies varied widely in location, subject selection procedure, and study purpose (Table 1). The range of parents with low health literacy was 10% to 48% across all 7 studies (Fig. 2), with a median estimated prevalence of 30% (interquartile range [IQR] 22–36%). Given that study groups were significantly different ($P < .001$), a pooled estimate was not calculated.

PARENT HEALTH LITERACY AND ED UTILIZATION (Q2)

Four studies, all good quality, evaluated the association between parent health literacy and ED utilization (Table 2).^{18,20,26,27} Two studies in parents of patients with asthma found that low health literacy was associated with a higher number of ED visits in children.^{18,26}

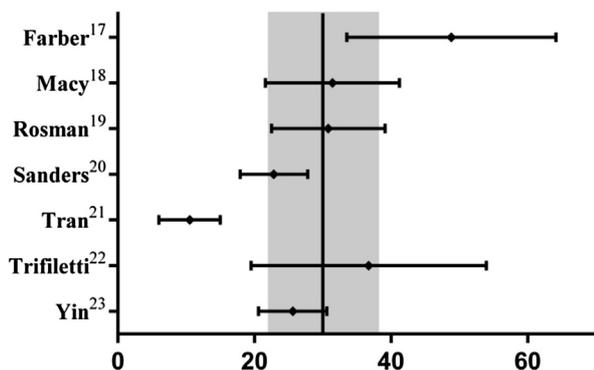


Figure 2. Forest plot of prevalence estimate of parent low health literacy and 95% CI (Q1). For each study, the estimated prevalence of low health literacy is shown as a diamond. The lateral bars indicate 95% CI. The vertical line indicates the median across all studies (30%), with the IQR in gray (22–36%).

Conversely, 2 studies, one involving children with asthma and the other study involving a general population, found no association between low health literacy and ED use; however, the general population study found a trend toward increased ED use in parents with low health literacy.^{14,27}

INTERVENTIONS TO TARGET LOW HEALTH LITERACY AND ED USE (Q3)

Eight studies investigated low literacy interventions and the effect on ED use.^{15,28–34} Six of those studies were scored as good-quality studies (Table 3). Overall, 4 studies utilized asthma-specific educational interventions,^{28–30,33} and the remaining 4 studies utilized general pediatric health educational interventions.^{15,31,32,34}

GENERAL HEALTH EDUCATION INTERVENTIONS AND ED USE

The 4 studies using low literacy pediatric general health educational interventions found reduced ED utilization in the majority of the studies. Three studies found reduced ED use after distributing a low literacy general pediatric health education book to nonurgent patients in the pediatric ED,¹⁵ Head Start parents,³¹ and patients in a family medicine residency primary care clinic.³⁴ In contrast, Rector and colleagues mailed a low literacy general health book about nonurgent pediatric and adult conditions to urban Medicaid beneficiaries that visited the ED in the 6 months before the distribution and found no difference in ED use for children after the intervention.³²

ASTHMA-SPECIFIC EDUCATION INTERVENTION AND ED USE

All of the studies involving children with asthma were performed on outpatients, and all demonstrated decreases

Table 2. Study Summary: LHL and Association With ED Use (Question 2)

| Study | Year | Instrument/Cut Point | Outcome | Relationship With LHL | Study Quality |
|-----------------------|------|----------------------|---|---|---------------|
| DeWalt ²⁶ | 2007 | REALM/9th grade | Relationship between LHL and asthma medication use, ED utilization, and hospitalization | LHL associated with more ED visits ($P < .05$) | Good |
| Macy ¹⁸ | 2011 | REALM/9th grade | Relationship between LHL and asthma knowledge, ED use after intervention | LHL associated with more ED visits ($P < .04$) | Good |
| Sanders ²⁰ | 2007 | S-TOFHLA/IMA | Relationship between LHL and cost of care and use of health care services | No association between LHL and ED use | Good |
| Shone ²⁷ | 2009 | REALM/9th grade | LHL and parental perceptions of asthma and use of health care services | LHL not associated with urgent care/ED use for asthma | Good |

LHL = low health literacy (inadequate, marginal, or <9th grade); ED = emergency department; REALM = Rapid Estimate of Adult Literacy in Medicine; (S-)TOFHLA = (Short) Test of Functional Health Literacy in Adults; REALM-SF = REALM—Short Form; IMA = inadequate, marginal, adequate health literacy.

in ED utilization after intervention. Three of the studies utilized home visits to educate parents using a low literacy curriculum,^{28,29,33} one of which included a coordinated care approach including education with monthly visits from asthma outreach worker and frequent clinic appointments.³³ The fourth study used a low literacy curriculum and neighbors as support workers and demonstrated decreased ED visits in parents that had high group participation ($P = .014$), but not in the intervention group overall ($P = .35$).³⁰

EVALUATION OF INTERVENTION EFFECTIVENESS

To further assess the effects from interventions, ORs were calculated from the 6 studies that utilized the proportion of children with an ED visit as the outcome measure. Two studies used individual ED use data and could not be incorporated into this analysis because of the different type of data. Peter's test showed no evidence of bias in subject selection ($P = .940$). Overall, 5 of the 6 studies favored the treatment (Fig. 3). The DerSimonian and Laird test revealed significant heterogeneity (chi-square = 427.76, $df = 5$, $P < .001$). A pooled OR was calculated using a random effects model, given the heterogeneity (OR 0.35; 95% CI 0.15–0.81). An additional analysis of the 4 general health education interventions studies was completed. Three of the 4 studies favored the treatment (Fig. 3), and a pooled OR was calculated (OR 0.36; 95% CI 0.13–1.01) again using a random effects model given significant heterogeneity (chi-square = 426.45, $df = 3$, $P = .000$).

DISCUSSION

To our knowledge, this is the first systematic review to address and provide a prevalence estimate for the health literacy of parents in the ED as well as explore the utility of low literacy interventions targeted at populations likely to have low health literacy on ED use. One previous systematic review concentrated on the relationship of health literacy and ED utilization; however, this review described mainly adult outcomes and did not provide an

overall prevalence for parents in the ED with their child; nor did it explore the impact of interventions on ED use.⁶

This study found that an estimated 1 in 3 parents seeking care for their children at the ED demonstrated low health literacy. Though similar to national estimates of low health literacy in parents,³ this estimated prevalence of low health literacy for parents in the ED is lower than the estimated prevalence of low health literacy in the general adult population (46%)² and adult patients seeking care in the ED (40%).⁶ This difference may be partially explained by the age of the study subjects, as older age is associated with increasing low health literacy and parents are younger than the general adult population, thus decreasing low health literacy prevalence.³ Additionally, in a national sample Yin et al found that nonparents had a significantly higher rate of low health literacy as compared to parents (38% and 28% respectively).³

VARIABLE ASSOCIATION BETWEEN LOW HEALTH LITERACY AND ED USE

Consistent with previous studies in adults which showed increased ED use,^{9,10} and given poor parental understanding of diagnosis, treatment course, and discharge instructions,^{3,22,23,35,36} this systematic review found evidence to support the relationship between low health literacy and increased ED use in parents of children with asthma. Our study did not find an association between low health literacy and ED use in general pediatric populations. Chronic diseases, such as asthma, may intensify the impact of low health literacy due to the increased care demand associated with managing these medical conditions. Parents with low health literacy have difficulty with medication label interpretation, dosing instrument selection, and medication dosing accuracy which all impact chronic disease management.^{13,23,26,37–41} Additionally, children of parents with low health literacy are less likely to have insurance and a primary care provider, both of which are significant risk factors for increased ED use and may be amplified in children with chronic disease.^{3,20,42–47}

Table 3. LL Interventions to Change ED Use in Populations Likely to Have LHL

| Study | Year | Study Design | Control Group | Population | Type of Intervention | Intervention | Measure of ED use | ED Use Outcome | Study Quality |
|-------------------------------------|------|--------------|---|---|--|--|-----------------------|--|---------------|
| <u>General Health Interventions</u> | | | | | | | | | |
| Herman ¹⁵ | 2009 | NRCT | Pre- vs postintervention | Primarily low income, minority population; ED nonurgent (triage levels 4–5) patients. | Health aid book | “What To Do When Your Child Gets Sick” (3rd–5th grade reading level) and instruction on use of the book. | Parent report | 30% reduction in number of participants using ED in last 6 mo ($P < .0001$) | Good |
| Herman ³¹ | 2010 | NRCT | Pre- vs postintervention | Head Start population, majority Medicaid or uninsured. | Health aid book | “What To Do When Your Child Gets Sick” (3rd–5th grade reading level) and instruction on use of the book. | Parent report | 58% reduction in ED visits per year per child ($P < .001$) | Good |
| Rector ³² | 1999 | RCT | No education | Urban Medicaid beneficiaries; ED visit in previous 6 mo. | Health aid book | Mailed “First Look” (4th grade reading level) to participants. | Medicaid records | No difference in ED visits for children whose parent received the intervention. | Good |
| Yoffe ³⁴ | 2011 | NRCT | Pre- vs postintervention and comparable clinic site | Primarily low income patients. | Health aid book | Education booklet, “The pediatric after-hours non-life-and-death almost-an-emergency booklet,” addressing most common pediatric ailments with (6th grade reading level) given in primary care clinic | Medical record review | Clinic patients where the booklets were distributed used the ED less ($P < .001$) compared to control clinic patients. | Fair |
| <u>Asthma Interventions</u> | | | | | | | | | |
| Bryant-Stephens ²⁸ | 2009 | RCT | Randomized crossover design with immediate and delayed intervention | Primarily minority and low income families; child with asthma and controller medication | Home visits with LL course, environmental intervention | Lay health educator home visits using “You Can Control Asthma” curriculum (5th grade reading level) and environmental intervention to avoid triggers. | Hospital database | 30% reduction in mean ED visits per year per participant ED visits ($P < .001$). | Good |
| Butz ²⁹ | 2006 | RCT | Standard asthma education | Primarily minority, low income, and Medicaid patients; child with persistent asthma. | Home visits with LL course | Asthma nurse specialist home visits for a 6-mo asthma education intervention based on Wee Wheezers and A+ Asthma Club programs (3rd–5th grade reading level). | Parent report | 18% reduction in ED use ($P < .05$) for 1 or more visits. No difference in mean number of visits. | Good |

| | | | | | | | | | |
|----------------------|------|------|--------------------------|--|---|---|------------------|--|------|
| Fisher ³⁰ | 2004 | NRCT | No education | Primarily low-income, African American families; child treated in ED or hospitalized for asthma. | LL course, neighborhood education program | Asthma education intervention using "Open Airways" (3rd-5th grade reading level), neighborhood involvement in programs. | Hospital records | Significantly decreased number of ED visits for children with high caregiver participation ($P = .014$), but not in overall group ($P = .35$). | Good |
| Stout ³³ | 1998 | NRCT | Pre- vs postintervention | Primarily urban, African American, Medicaid patients; high health care utilizers; child with asthma. | LL asthma education, coordinated care model | Monthly visits from asthma outreach worker, educational component with "Open Airways" (3rd-5th grade), frequently scheduled appointments. | Chart review | 65% reduction in number of ED visits ($P = .038$). | Fair |

LHL = low health literacy; ED = emergency department; LL = low literacy; RCT = randomized controlled trial; NRCT = non-randomized, controlled trial; UCT = uncontrolled trial.

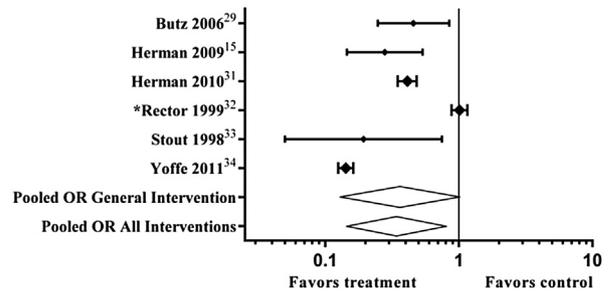


Figure 3. Forest plot of ORs for educational interventions (all interventions and general health interventions) and ED use. For each study, the OR is shown as a diamond with area proportional to the sample size. The lateral bars indicate 95% CI. Treatment is favored by studies with OR and 95% CI left of the vertical line. *Mailed intervention, with no evidence that the intervention was received or read.

LOW LITERACY INTERVENTIONS POTENTIALLY EFFECTIVE IN REDUCING ED USE

No previous review has examined the impact of low literacy educational interventions in populations likely to have low health literacy on ED use. The data from this review support the hypothesis that low literacy interventions result in reduced ED utilization. In patients with asthma, investigators used low literacy educational interventions along with comprehensive approaches such as home visits or increased office visits, which may independently lead to the success of the intervention.^{28-30,33} However, the effect was also found with the use of only minimal teaching, such as providing a booklet in clinic³⁴ or supplying books to Head Start or nonurgent ED patients with negligible training.^{15,31} The only intervention not leading to significant reductions in ED use relied on a mailed brochure, with no evidence that the brochure was received or read, as opposed to more direct interventions.³² Notably, only 1 of these studies was performed in the ED, with the remainder conducted on outpatients.

LIMITATIONS

Similar to all reviews, this study is limited to the quality and quantity of peer-reviewed literature available. The studies that met our inclusion criteria varied in sample size, population, and subject recruitment strategies, and there was significant heterogeneity among studies. Overall, there was an effect of low literacy educational interventions on ED use; however, these results were obtained in populations at high risk for low health literacy and not documented low health literacy, of which none have been performed. Additionally, the intervention sustainability remains unknown, as none evaluated a time longer than 1 year after the intervention. This review is potentially limited by publication bias given that ineffective interventions may not be published; however, the outcome of interest (ED use) included in this review was not the main outcome of the studies, therefore limiting this bias. Additionally, we limited the review to studies in the United States, so health system differences may have impacted ED

utilization rather than the construct of health literacy, and this may have resulted in the exclusion of studies that would have provided additional results.

FUTURE DIRECTIONS

Physicians need to be cognizant of the finding that a significant number of parents bringing their children to the ED have low health literacy. These physicians may need to adapt communication strategies and include low literacy strategies, such as the teach-back method and incorporation of health literacy–related education materials into ED discharge materials. Situations with high clinical demand likely exacerbate low parent health literacy (eg, providing incorrect doses of asthma medications), whereas parents of otherwise healthy children may not have a challenge to their ability to obtain, process, and use health information. Potential situations of high clinical demand are as diverse as chronic illness, infant care, acute gastroenteritis, and febrile illness, all of which may benefit from interventions.

Interventions impacting ED use have great potential given the success of interventions targeting parents likely to have low health literacy. The dearth of literature on health literacy–related interventions and ED use reveals a clear gap in the literature and future study of health literacy–related interventions is crucial. Specific to the ED, health literacy–related interventions targeting populations with high clinical demands from parents (ie, chronic illness, infant care, acute illness) would be valuable.

CONCLUSIONS

Approximately 1 in 3 parents seeking care with their children at the ED have low health literacy, limiting their ability to process, understand, and make medical decisions for their children. A potential relationship exists between low health literacy and increased ED utilization. Low literacy interventions targeted at parents likely to have low health literacy seem to result in decreased ED utilization. However, a clear gap in the literature exists: there are no published interventions targeted specifically at parents with known low health literacy. Applying targeted or population-based health literacy related educational interventions has the potential to reduce repeat ED visits, reduce health care expenditures, and narrow the health disparities gap by empowering parents with low health literacy to obtain appropriate care for their child.

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