

Improving the health of adults with limited literacy through complex, multi-faceted interventions: Evidence and implications for public health

Review on which this evidence summary is based:

Clement, S., Ibrahim, S., Crichton, N., Wolf, M. & Rowlands, G. (2009). **Complex interventions to improve the health of people with limited literacy: A systematic review.** *Patient Education and Counseling* (75):340-351. DOI: 10.1016/j.pec.2009.01.008.

Review Focus

- P** Adults **with limited literacy** or numeracy
- I** **Complex (multi-faceted) interventions** (e.g. health professional-directed; literacy education; and health education/management) intended to improve outcomes for people with limited literacy/numeracy
- C** Any active (e.g. minimal intervention, waiting list or attention control, alternative complex intervention) or inactive (e.g. usual care) control
- O** **Health-related outcomes:** blood pressure, weight-related measures, blood cholesterol; health knowledge; health behaviours (diet modification, medication adherence); self-reported health status/quality of life; health-related self-efficacy/confidence; utilization of health care; health professional behaviour/skills

Review Quality Rating: 10 (strong) *Details on the methodological quality are available [here](#).*

Considerations for Public Health Practice

Conclusions from Health Evidence	General Implications
<p>This high quality review is based on randomized controlled trials of low to moderate methodological quality. The majority of included studies likely did not have an adequate sample size to observe a statistically significant effect.</p> <p>Complex interventions are effective in improving <i>some</i> health-related outcomes for people with limited literacy:</p> <ul style="list-style-type: none"> • Health-related self efficacy / confidence • Utilization of health care • Health provider behaviour / skills <p>The evidence is <u>mixed</u> for the following :</p> <ul style="list-style-type: none"> • Clinical outcomes • Health knowledge • Health behaviours <p>There was <u>no impact</u> on:</p> <ul style="list-style-type: none"> • Self-reported health status/quality of life <p>Interventions studied varied widely (e.g. health issue addressed; duration, intensity, and delivery; extent to which literacy factored into the intervention, including its development), as did the measures and control groups used.</p> <p>All study measures focused primarily on limited literacy, with only three addressing limited numeracy; the application for numeracy is less evident and not reported here.</p>	<p>Based on this review, public health <i>should</i> include and/or support complex, multi-faceted interventions to address patients with limited literacy in the areas of health-related self efficacy, utilization of health care, and communication with health providers.</p> <p>The current body of evidence cannot definitively recommend or reject the use of complex, multi-faceted interventions to address dietary outcomes, overall health knowledge and behaviours for adults with limited literacy. However, the interventions appear to be effective in improving <i>specific</i> knowledge and behaviours, such as understanding key terms and medication dosage regimes and correct medication self-reporting.</p> <p>Public health should <i>not recommend</i> complex, multi-faceted interventions for improving self-reported health status or quality of life in adults with limited literacy.</p> <p>Due to the variation in interventions, it is not possible to identify if specific components of the interventions (e.g. care management, verbal presentation, material in simplified language, pictorial information, video/audiotapes, checking for understanding, spacing information) were more effective than others. Public health decision makers should be aware that limited evidence (i.e. 1 study) is available for many of the outcomes described in this table.</p>

Evidence and Implications

Evidence points are not in order of the strength of the evidence.

What's the evidence? **	Implications for practice and policy
<p>1. Impact on Clinical Outcomes (4 studies)</p> <ul style="list-style-type: none"> • <i>Literacy education intervention</i> reduced median depression scores in adults with depressive symptoms (6) vs. usual care (10) in a community setting (p=0.04) (1 RCT). • <i>Health education interventions</i>: <ul style="list-style-type: none"> - Educational session with a clinical pharmacist reduced death/hospital admission for adults with heart failure in an outpatient setting vs. usual care + educational pamphlet (IRR 0.53, 95% CI 0.32-0.89) (1 RCT). There was <u>no impact</u>, however, in a subgroup analysis of higher literacy groups. - An intensive educational session with a pharmacist reduced systolic (mm Hg, -7 vs. 2, 95% CI -16 to -3, p=0.008) and diastolic blood pressure (mm Hg, -4 vs. 1, 95% CI -9 to -1, p=0.002) in adults with poorly controlled type II diabetes vs. usual care + 1 hr educational session. <u>No impact</u> on total blood cholesterol or haemoglobin levels (1 RCT). - Nutrition education had <u>no impact</u> on blood pressure and cholesterol for African-American adults with high blood pressure or cholesterol vs. self-directed version of the same program in an outpatient setting (1 RCT). 	<p>1. Impact on Clinical Outcomes:</p> <ul style="list-style-type: none"> • Public health should consider the use of literacy education as part of a comprehensive approach, targeting adults with limited literacy and depressive symptoms. • Interactive, directed health education programs may be effective at reducing death/hospital admission rates but do not appear to affect blood cholesterol and blood pressure. Public health should not prioritize these interventions over simpler, less intensive, and potentially self-directed education options.
<p>2. Impact on Health Knowledge (5 studies)</p> <ul style="list-style-type: none"> • <i>Health education interventions</i>: <ul style="list-style-type: none"> - Verbal counseling provided with dispensed medication increased understanding of dosage regimen (% correctly reporting, 88%) vs. usual care (70%) in a hospital pharmacy (p=0.03) (1 quasi-RCT). - Group education improved understanding of HIV-related terms (mean score (SD), 6.16 (7.97)) vs. usual care (1.91 (3.60)), (t=-3.16, p<0.0001) but had <u>no impact</u> on overall HIV knowledge in Latino Spanish-speaking adults with HIV in an outpatient setting (1 RCT). - <u>No impact</u> on mothers' knowledge of newborn hearing screening in a maternity unit setting but, in a subgroup analysis, there was a significant increase for mothers with lower levels of education (5.00 vs. 3.38, p<0.05) (1 quasi-RCT); - <u>No impact</u> on: veterans' hypertension knowledge in a telephone intervention (1 RCT); medication knowledge in adults aged 65+ with a chronic illness in an outpatient setting (1 quasi-RCT). 	<p>2. Impact on Health Knowledge:</p> <ul style="list-style-type: none"> • Overall understanding of health issues does not appear to improve with intensive verbal and/or group health education programs. Nonetheless, Public Health should consider the usefulness of these approaches to improve specific knowledge, such as dosage regimen and key definitions or facts.
<p>3. Impact on Health Behaviours (7 studies)</p> <ul style="list-style-type: none"> • <i>Health education interventions</i>: <ul style="list-style-type: none"> - Personalized dietary feedback, booklets and structured telephone calls reduced self-reported fat intake (mean score (SD), 1.87 (0.35)) vs. usual care (1.95 (0.34)) (p=0.0027) but had <u>no impact</u> on self-reported fiber intake for adults in a rural area (1 RCT). - A nutrition-focused heart disease prevention program reduced sodium intake (mean mg (SD), 2545.97 	<p>3. Impact on Health Behaviours:</p> <ul style="list-style-type: none"> • Public Health should consider complex interventions to improve healthy eating and reduce caloric intake in general, particularly in low income families, but note that the evidence is mixed on particular dietary measures. • Public Health should <i>not</i> employ complex interventions to impact medication adherence or compliance, but should note that these interventions may be effective in improving reporting of self-medication.

<p>(1164.12) vs. attention control (3118.13 (2386.19)), ($p < 0.05$) in Hispanic adults in a community setting, but had <u>no impact</u> on total fat, saturated fat, or cholesterol intake (1 cluster RCT).</p> <ul style="list-style-type: none"> - Low-fat nutrition group education improved self-reported healthy low fat eating in low-income families vs. printed materials in a community setting (mean difference, -0.03, 95% CI -0.01 to -0.005) (1 cluster RCT). - Low-fat nutrition group education reduced caloric intake (change in % calories from total fat, -2.8 (2.4)) vs. an alternative program (-0.5 (2.0)), ($p = 0.01$) in a community setting (1 cluster RCT). - Intensive diabetes management program improved self-report of Aspirin use by adults with poorly controlled type II diabetes (% correctly reporting, 91%) vs. usual care + 1 hr educational session (58%), ($p < 0.0001$) in a telephone intervention (1 RCT). - <u>No impact</u> on medication adherence for veterans with hypertension in a telephone intervention (1 RCT) or Latino Spanish-speaking adults with HIV in an outpatient setting (1 RCT). 	
<p>4. Impact on Self-Reported Health Status / Quality of Life (1 RCT)</p> <ul style="list-style-type: none"> • <i>Health education</i> session with a clinical pharmacist had <u>no impact</u> on heart failure-related quality of life reporting in adults with heart failure vs. usual care + educational pamphlet in an outpatient setting 	<p>4. Impact on Self-Reported Health Status / Quality of Life</p> <ul style="list-style-type: none"> • Public Health should not rely on educational interventions alone for improving self-reported quality of life (but note that this is based on a single study).
<p>5. Impact on Health-Related Self-Efficacy / Confidence (1 RCT)</p> <ul style="list-style-type: none"> • Tailored <i>health education</i> telephone intervention (with verbal medication explanation) increased self confidence in hypertension management for veterans (mean score change, 0.33) vs. usual care (-0.10), ($p = 0.007$) 	<p>5. Impact on Health-Related Self-Efficacy / Confidence</p> <ul style="list-style-type: none"> • Public Health should consider educational interventions for improving health-related self-confidence in chronic disease management (but note that this is based on a single study)
<p>6. Impact on Utilization of Health Care (1 quasi-RCT)</p> <ul style="list-style-type: none"> • <i>Health professional-directed intervention</i>, in which professionals receive training on screen and patient communication, increased percentage of patients screened for colorectal cancer (42.3%) vs. usual care (32.4%) in an outpatient setting ($p = 0.003$). • There was <u>no impact</u> in a subgroup analysis of higher literacy groups in the same study. 	<p>6. Impact on Utilization of Health Care</p> <ul style="list-style-type: none"> • Public Health should consider health professional-directed interventions for improving patients' utilization of care, particularly as it relates to screening (but note that this is based on a single study)
<p>7. Impact on Health Provider Behaviour / Skills (2 studies)</p> <ul style="list-style-type: none"> • <i>Health professional-directed intervention</i>, in which physicians were notified of patients' literacy status, increased use of literacy-relevant management strategies when treating adults with type II diabetes (% reporting use of >3 strategies, 20%) vs. usual care (7%) in an outpatient setting (OR 4.7, 95% CI 1.4-16.0, $p = 0.01$) (1 cluster RCT). • A group <i>health education intervention</i> improved Latino Spanish-speaking adults with HIV's perceived quality of communication with health providers (mean score change (SD), 5.28 (5.37)) vs. usual care (1.11 (5.97)) in an outpatient setting ($p < 0.001$) (1 RCT). 	<p>7. Impact on Health Provider Behaviour / Skills</p> <ul style="list-style-type: none"> • Public Health should consider improving health provider - patient communication quality with simple, health professional-directed interventions (such as notifying providers of patients' literacy level), or more complex group health education interventions.
<p>8. Satisfaction Levels (2 studies)</p>	<p>8. Satisfaction Levels</p>

<ul style="list-style-type: none"> • <i>Patients</i>: Intervention group (adults with poorly controlled type II diabetes in an intensive educational session) were <i>more</i> satisfied than those receiving usual care (Diabetes Treatment Satisfaction Questionnaire, difference in mean change, 3, 95% CI 1-6) (1 RCT) • <i>Providers</i>: Intervention group (physicians notified of diabetes patients' literacy status) were <i>less</i> satisfied (82%) than those receiving usual care (96%) (adjusted OR 0.2, 95% CI 0.1-0.5) (1 cluster RCT) 	<ul style="list-style-type: none"> • While interventions focused on health provider behaviour are effective (<i>see above</i>), Public Health should also take provider satisfaction into consideration in order to ensure maximum adherence to any intervention.
<p>Legend: P - Population; I - Intervention; C - Comparison group; O - Outcomes; CI - Confidence Interval; IRR - Incidence Rate Ratio; OR - Odds Ratio; RR - Relative Risk; RCT - Randomized Control Trial; **For definitions see the Health Evidence Glossary www.healthevidence.org/glossary.aspx</p>	
<p>** Note: only the primary outcomes from each study are addressed in this evidence table. Review authors reported on primary and secondary outcomes (see Table 4) but only included data for primary outcomes.</p>	

Why this issue is of interest to public health in Canada

The Expert Panel on Health Literacy defines health literacy as “the ability to access, understand, evaluate and communicate information as a way to promote, maintain and improve health in a variety of settings across the life-course”¹. Health literacy was first recognized as an issue in Canada in the late 1980s and early 1990s, with the founding of the National Literacy and Health Program at the Canadian Public Health Association, in 1994. The Public Health Agency of Canada estimates that 60% of adults (16+) and 88% of seniors (65+) have low health literacy². The 2003 IALSS data show that self-reported health declines with literacy scores. Canadians with the poorest scores for health literacy are 2.5 times more likely to see themselves in fair or poor health as those with the highest scores¹. Lower literacy scores are associated with a myriad of outcomes of interest to public health, including: physical and mental health outcomes, engagement in health-promoting behaviours, participating in screening programs, diabetes control, and others¹. The positive health and lifestyle implications for improved health literacy are potentially far-reaching. Literacy interventions can improve with chronic disease management, medication adherence, and general quality of life. The Public Health Association of British Columbia has proposed an inter-sectoral approach to improving health literacy, involving governments, health services, the education sector, workplaces and businesses, and community organizations³. This review contributes to one component of their framework, developing knowledge, about which types of interventions are effective. Previous reviews have looked at simple interventions, while this review looks at complex, multifaceted interventions. The authors caution that with the complex interventions we do not know the key ingredient, and recommend in the future that implementation of literacy interventions incorporate some method of evaluation.

1. Rootman, I. and Gordon-EI-Bihberty, D. (2008) A Vision for a Health Literate Canada: Report of the Expert Panel on Health Literacy. Ottawa, ON: Canadian Public Health Association. Retrieved from http://www.cpha.ca/uploads/portals/h-l/report_e.pdf
2. Public Health Agency of Canada. (2011, Nov 15) About Health Literacy. Retrieved from <http://www.phac-aspc.gc.ca/cd-mc/hl-ls/index-eng.php>
3. Mitic, W. and Rootman, I. (2012) An Inter-sectoral Approach for Improving Health Literacy for Canadians. Public Health Association of BC. Victoria, BC: Public Health Association of British Columbia. Retrieved from http://www.cpha.ca/uploads/portals/h-l/Intersectoral_e.pdf

Other quality reviews on this topic are available on www.healthevidence.org

Suggested citation

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This evidence summary was written to condense the work of the authors of the review referenced on page one. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

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