The effectiveness of a community health worker outreach program on healthcare utilization of West Baltimore City Medicaid patients with diabetes, with or without hypertension

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Volunteers with extensive community experience and with close links with the targeted community were trained as community health workers (CHWs), to work as patient case managers for diabetic patients with or without hypertension in the targeted community. These CHWs were given a minimum of 60 hours training, a monthly bus pass and money to cover expenses. CHWs would start with 1 or 2 patients and then increase the caseload to a maximum number of 10. The role of the CHW was to keep in close touch with the patient, to arrange necessary medical appointments, to check that the patients were looking after themselves properly, to perform simple medical tests, to check that Medicaid eligibility had been established, and to give general social support.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised Afro-American patients aged 18 years or older, with a diagnosis of diabetes mellitus (DM) with or without hypertension, who were enrolled in the Medicaid programme. The patients had to be assessed as having the potential to function independently. They were excluded if they were incapable of making decisions on their own health care, or if they had another overwhelming medical problem. Patients who died during the study period, or who could not be matched to the Medicaid claims data were excluded from the study.

Setting
The setting was community care. The economic study was carried out in Maryland, USA.

Dates to which data relate
The effectiveness evidence and resource evidence related to 1992 to 1994. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was carried out retrospectively on the same sample of patients that provided the effectiveness evidence.

Study sample
No power calculations to determine the sample size were reported. All eligible patients were included in the study. Those excluded were those not enrolled in the Maryland Medicaid programme, non Afro-Americans, those who died during the study and those for whom Medicaid claims data could not be found. Patients with 5 or more CHW contacts were included. A total of 543 patients were initially approached to take part in the study, of which 238 patients satisfied the inclusion or exclusion criteria. Of these, 117 patients had 5 or more CHW contacts and were included in the study.

**Study design**
This was a retrospective, within-group, comparison study that was conducted in a single centre.

**Analysis of effectiveness**
The analysis considered patients who had at least 5 CHW contacts and excluded those patients who dropped out. A lack of data meant that clinical data for the patients was unavailable. The authors therefore used measures of health care resource utilisation as a proxy measure for effectiveness. The measures used were all emergency room (ER) visits, ER admissions, total hospital admissions and length of hospital stay (LOS).

**Effectiveness results**
The mean number of ER visits was 1.49 (standard deviation, SD=2.2) one year prior to the programme starting and 0.93 (SD=1.8) one year after the intervention had been introduced.

The within-group change was a mean decrease of 0.56 (standard error, SE=0.2) or 38%.

The number of ER admissions was 0.64 (SD=1.4) one year prior to the programme starting and 0.32 (SD=1.3) one year after.

The within-group change was a mean decrease of 0.32 (SE=0.1) or 53%.

The mean total hospital admissions were 0.95 (SD=1.5) one year prior to the programme and 0.66 (SD=1.4) one year after.

The within-group change was a mean decrease of 0.29 (SE=0.2) or 30%.

The mean LOS was 6.35 (SD=11.8) one year prior to the programme and 6.69 (SD=26.2) one year after.

The mean within-group change was an increase of 0.34 (SE=2.6) or 5%.

The LOS data had a positively skewed distribution and required logarithmic transformations. The transformed data exhibited a 5% decrease in LOS, (p=0.02).

**Clinical conclusions**
The CHW programme improved patient health, as shown by the reduced number of ER and hospital admissions, which were used as a proxy for effectiveness.

**Measure of benefits used in the economic analysis**
No summary measure of benefit was calculated as a cost-consequences analysis was carried out.

**Direct costs**
No discounting was carried out since the costs were incurred during 2 years. The cost analysis used Medicaid reimbursements as an indication of the direct costs. This meant that the costs of medication were not included. There was no breakdown of the costs into prices and quantities. The cost analysis did not consider the training of CHWs and the reimbursement of their expenses. Although the cost estimate was derived from actual data, when patients had
incomplete Medicaid coverage it was assumed that the daily cost applied to the whole year. No price year was reported.

**Statistical analysis of costs**
No statistical analysis of the costs was carried out.

**Indirect Costs**
No indirect costs were calculated.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was carried out.

**Estimated benefits used in the economic analysis**
A cost-consequences analysis was conducted. See the 'Effectiveness Results' section.

**Cost results**
The calculated mean costs were $8,266 in the year before the intervention and $6,020 in the year after the intervention.

**Synthesis of costs and benefits**
Not relevant as a cost-consequences analysis was carried out.

**Authors' conclusions**
The community health worker (CHW) programme reduced the costs, improved patient health and was, therefore, a dominant strategy.

**CRD COMMENTARY - Selection of comparators**
The comparator in this within-group comparison study was no CHW programme, which represented current practice in the authors' setting. You should decide if the comparator represents current practice in your own setting.

**Validity of estimate of measure of effectiveness**
The study design has a major weakness in that it only studied patients who established a successful relationship with their CHW. Out of 238 patients who met the eligibility criteria, 117 were studied as they had 5 or more CHW contacts. Thus, the measures of effectiveness used will probably have overestimated the health improvements brought about by the programme. In addition, the presence of selection bias in this type of study can never be eliminated, as the patients self select to participate. The exclusion of patients who died may well have led to the overestimation of the health benefits of the programme. Unfortunately, the authors were unable to directly measure the health outcomes of the patients studied and had to rely on health service utilisation measures as proxy variables. The internal validity of the study is likely to be fairly low due to the observational retrospective study design.

**Validity of estimate of measure of benefit**
The authors did not derive a summary measure of health benefit. The study was therefore a cost-consequences analysis.
Validity of estimate of costs
The authors do not appear to have included all the relevant costs in their cost calculations. For example, they did not include the costs of training and reimbursing the CHWs. No indirect costs were included in the study. The costs and the quantities were not reported separately and the authors did not indicate how closely the Medicaid reimbursements would correspond to the medical costs. The omission of training and reimbursement costs would have led to an underestimation of the costs, as would the omission of patients who did not develop a relationship with the CHW. The exclusion of patients who died would have led to the omission of patients who may have incurred exceptionally high costs and, therefore, an overestimation of the cost reduction caused by the programme. The omission of the indirect costs will underestimate the cost-savings resulting from the programme.

Other issues
The authors referred to other studies that had described and researched CHW involvement in improving health. However, they were unaware of any study that was aimed at targeting diabetic patients in African-American communities with Afro-American CHWs. The study concluded that, although the generalisability to other settings cannot be assumed, the use of CHWs from the targeted community can improve health outcomes and reduce the costs.

Implications of the study
The authors recommended that a similar study, which considers effects over a longer time span and directly measures the clinical outcomes, should be performed. Such a study should also take the cost of training CHWs into account and assess the outcomes of all patients initially recruited into the study.

Source of funding
Funded by the Maryland Health Services Cost Review Commission and the UMAB Foundation Community Pharmacy Fund.

Bibliographic details
Fedder D O, Chang R J, Curry S, Nichols G. The effectiveness of a community health worker outreach program on healthcare utilization of West Baltimore City Medicaid patients with diabetes, with or without hypertension. Ethnicity and Disease 2003; 13(1): 22-27

PubMedID
12723008

Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; African Americans; Aged; Aged, 80 and over; Baltimore /epidemiology; Community Health Workers /utilization; Community-Institutional Relations; Delivery of Health Care /statistics & numerical data /utilization; Diabetes Mellitus /epidemiology /ethnology /therapy; Female; Humans; Hypertension /epidemiology /ethnology /therapy; Male; Medicaid /statistics & numerical data /utilization; Middle Aged; Program Evaluation; Quality of Life; Retrospective Studies

AccessionNumber
22003009314

Date bibliographic record published
31/03/2004

Date abstract record published
31/03/2004