Michigan Journal of Public Health

Volume 5 | Issue 1 Article 11

2011

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Controlling Hospital Admission through Prevention Education: The Role of Community Health Workers

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A steady increase in cases of Type-II diabetes has been a growing concern across Michigan communities for some time. Based on Michigan BRFSS data and population data, an estimated 12.2% of adults had some type of diabetes in 2007 (with roughly 90% having Type-II). (BRFSS, 2007) In 2010, the state estimated the per-person cost of diagnosed diabetes at $9,975 totaling $7 billion statewide. The state attributed another $1 billion in outlays for undiagnosed diabetes. (The Facts, 2010) This costly trend is the product of an array of environmental, social, and political factors, and as such, the complexities of the issue cannot be curtailed or overlooked. Among other factors, it is the diversity in the historical and ethnic backgrounds of at-risk communities that poses a substantial challenge for healthcare providers. From an ethnicity perspective, Black non-Hispanics, Hispanics, and American Indians experience the highest rates of diabetes. As representative members of their communities, Community Health Workers (CHW) present an opportunity to bridge the communication gap that frequently exists between providers and patients. CHW programs have been supported by various groups, such as the American Association of Diabetes Educators, for their effectiveness in educating people with and at risk for diabetes and advancing self-management of the disease. (AADE, 2009)

Between 2007 and 2009, the Trinity Health *Call to Care* initiative funded the Muskegon Community Health Project (MCHP) to test a Community Health Worker outreach and education model for low-income, at-risk diabetics within the Muskegon community. The project reached out to 138 participants to provide education on the management of Type-II diabetes through in-home visits as well as primary care office sessions. After testing the effects of several program components against Hemoglobin A1c (HgbA1c) counts in participants, we concluded that the MCHP appeared to have been effective and should be replicated in other at-risk communities.

To test the effectiveness of MCHP, we examined the effect of months in the program, home visits, and of office visits on HgbA1c levels of the participants. Through bivariate and multivariate testing and analysis, we were able to determine whether each program component had an effect on HgbA1c; we also were able to detect when the component seemed to start being effective and when it stopped being so; furthermore, we used measures of association to assess the strength and direction of relationships established between program components and HgbA1c levels. Our findings were able to determine the effect of each of the three aspects of the MCHP.

Testing revealed that months in the program had a positive affect (drop in HgbA1c) as soon as a participant was enrolled for at least six months, and ceased to have a detectable effect after the 19^{th} month of enrollment. Similarly, we began seeing drops in HgbA1c levels as soon as a participant had been visited at home at least twice and we ceased to detect an effect after the 10^{th} home visit. Number of office visits had a random

relationship of unknown strength and direction of effect on HgbA1c levels. During the course of linear regression analysis, we determined that the number of months and number of home visits pointed to the same relationship, as months in the program created an opportunity to have more home visits. Subsequently, we were able to attribute a .45 drop in HgbA1c levels for each home visit; this indicates that the model is responsible for approximately 20% of the recorded changes in participants' HgbA1c levels.

It should be noted that no data were included to describe exactly what took place during each home and office visit, therefore, the effect of intensity of these visits was not a measurable factor. We also did not know when home visits occurred in conjunction with office visits, which could have greatly affected the power of such visits. Also noteworthy is the fact that home visits focused entirely on disease management; conversely, office visits could have been scheduled for another reason while still including a session on diabetes self-management (this scenario could potentially reduce the effect of the training encounter, but these findings should not be interpreted as evidence that CHW interfaces within the primary care setting are ineffective).

As the data showed, home visits by CHWs for diabetes self-management education were clearly effective in lowering HgbA1c levels of low income, at-risk persons diagnosed with Type-II diabetes. The positive impact of MCHP was clear and similar programs should be attempted in other at-risk Michigan communities. Going forward, cost-effectiveness analyzes would provide further insight into the viability of the CHW model and its hopes for sustainability in our communities.

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