

Research Article

Perceived risk of kidney disease and its risk factors: Results of a community health survey

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Abstract

Perception of disease risk is an important determinant of health-related behaviors. The risk of kidney disease is often overlooked, and the severity of its consequences under recognized. The goal of this study was to assess perception of risk for kidney disease in a community sample in Brooklyn, New York, an area with elevated rates of many disease processes that are contributors to renal impairment. The sample consisted of 350 individuals recruited at various community health fairs throughout Brooklyn. 34% had received a physician diagnosis of hypertension, 15% of diabetes, and 4% kidney disease. A large part of the sample reported not feeling in control of their respective diseases. Those with a family history of hypertension ($\chi^2=13.3$, $p<.001$) and diabetes ($\chi^2=14.8$, $p<.001$) were more likely to consider themselves at increased risk for the diseases compared to those without a family history. Only 7% of those diagnosed with hypertension and 10% of those diagnosed with diabetes, both leading risk factors for kidney disease, considered themselves to be at increased risk for renal impairment. A binomial logistic regression was used to assess contributors to perception of disease risk. Results revealed that a diagnosis of diabetes ($B=1.5$, $p=.04$) and feeling that one's diabetes is out of control ($B=1.7$, $p=.03$) were significantly associated with an increase in perceived risk for renal disease. Interventions tailored to providing education about risk factors for kidney disease, helping improve perceptions of control over disease management, and emphasis on early disease detection are essential for improving health outcomes.

Introduction

According to the Center for Disease Control, 1 in 3 diabetics and 1 in 5 individuals with hypertension have kidney disease [1] yet many of them are unaware. These risk factors are even more prevalent in the African American population [2,3]. In a study with over 2,000 Black participants, Waterman *et al.*, 2008 found that approximately 44% of their sample had a risk factor for kidney disease, and fewer than 3% of their overall sample acknowledged kidney disease to be a health concern [4]. In a study of primary care patients in Maryland, hypertensive participants demonstrated a low level of kidney disease concern [5]. Clearly, there is a lack of awareness of the risk for kidney disease.

Perceived risk is an important construct for a variety of reasons. The most significant consequence of low perceived risk of kidney disease is the decreased opportunity for prevention and early treatment [6]. The Health Belief Model has posited that the more salient the risk of a particular disease appears, the more likely an individual will act to prevent or treat that disease [7]. Consequently, understanding a person's perceived risk for a disease is a key component in understanding their likelihood to be actively engaged in managing their risk factors for that condition. Beyond the impact on the individual, a disease's salience may well be associated with the likelihood of health actions targeting that disease within a broader community. While increased kidney disease risk in minority populations in the US is due to a complex of individual, community and society level factors, low perceived risk may also be an important contributor to this health inequity [8,9]. The impact of low perceived risk of a disease may not only impact the individual or the community, but may also affect funding for further scientific inquiry. The "patient-centered" movement within medicine,

which seeks patients and researchers collaboratively set study goals, has been growing within nephrology [10]. However, if patients do not appreciate and prioritize kidney health, it may well affect the future research agenda.

According to a recent survey [11], Brooklyn is an epicenter of increased barriers to care and overall higher rates of disease. Specifically, compared to the rest of the country and even New York City, Brooklyn has a higher incidence and prevalence of diabetes, as well as renal disease caused by diabetes. Similarly the rate of age-adjusted heart attacks is higher in Brooklyn (15.9 per 10,000) than in the rest of the city (13.5 per 10,000) or the state (15.1 per 10,000) [11].

The objective of this study was to collect data using a brief, anonymous survey in a low-income community on perception of kidney risk, including high blood pressure, and diabetes, and quality of life.

Methods

Survey development

The questionnaire used in this brief survey was designed with the intention of being administered at health fairs to participants

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with varied levels of health literacy. A group of health disparities researchers, clinicians and community members were consulted about the health conditions most underappreciated by the residents of Brooklyn. Once the key disease process was identified (kidney disease), a questionnaire was created that asked about family history, physician diagnosis, perceived risk, and perceived efficacy in the management of their health conditions. Additional information on demographic and quality of life was also requested. The questionnaire was then piloted on 3 community members who provided feedback on their interpretations of the questions, and after some minor adjustments, a final survey was created. Answers were provided on either a Likert-style scale or were yes/no. No identifying information was collected. The survey was estimated to take about 6 minutes to complete.

Recruitment procedure

Individuals of all races and ethnicities at various community health fairs throughout Brooklyn were approached for the current study. Anyone over the age of 21 who was willing to complete the survey and was fluent enough in English to answer the questions was eligible to participate. Overall, 5 different community fairs served as recruitment sites. Data was collected from May 2015 through October 2015.

Results

A total of 350 people completed the survey. The sample was 71% female. 78% of the sample self-identified as African American, 10% identified as Hispanic, 5% as Caucasian, 1% as Asian, and 6% as "other" or "multiethnic." 9% of the sample was 21-25 years- old, 41% was between 25-45 years- old, and 50% was over 46 years-old (see Table 1).

Medical history and disease risk

34% of the sample indicated they had received a physician diagnosis of hypertension, 15% a diagnosis of diabetes, and 4% reported a physician diagnosis of kidney disease. In terms of disease management, 50% of individuals with high blood pressure felt in control of their hypertension. 37% of diabetics reported being in control of their diabetes. 22% of patients with kidney disease reported feeling in control of their disease.

Regarding family history, 60% of the sample reported a family history of hypertension, 45% reported a family history of diabetes,

and 7% reported a family history of renal disease: Of those without a diagnosis of hypertension, 19% of the sample with a family history of high blood pressure considered themselves at risk for hypertension as compared to only 4% of those without a family history ($\chi^2(1, N=231)=13.3, p=.000$). Of those without a diagnosis of diabetes, 28% of the sample with a family history of diabetes considered themselves at risk for the disease as compared to only 11% of those without a family history ($\chi^2(1, 298)=14.8, p=.000$). Of those without a diagnosis of kidney disease, 10% of the sample with a family history of renal disease considered themselves at risk for kidney disease as compared to only 4% of those without a family history, although these groups were not significantly different ($p>.05$). Among those diagnosed with hypertension but not kidney disease, 7% thought they were at risk for renal disease. Of those with diagnosed diabetes but not kidney disease, 10% of individuals thought they were at increased risk for renal disease.

Quality of life

87% of the sample described their overall quality of life as "very good" or "good," while 74% reported feeling satisfied with their health. There was no significant relationship between quality of life and a diagnosis of hypertension, diabetes, and kidney disease ($p>.05$). Regarding health satisfaction, those who were not satisfied with their health were more likely to have hypertension ($\chi^2(1, N=323)=4.5, p=.034$) and diabetes ($\chi^2(1, N=323)=6.9, p=.009$). Overall health satisfaction was not associated with kidney disease.

To examine the relative contribution of the various sources of increased kidney disease risk, a binomial logistic regression was undertaken (Table 2). Known risks for kidney disease (family history of hypertension, diabetes or kidney disease, a physician diagnosis of hypertension or diabetes and feeling your diabetes or hypertension are poorly controlled) were all entered into a model predicting increased perceived risk of kidney disease. None of the family history variables or hypertension variables predicted increased perceived risk ($p>.05$, all cases). Only having been diagnosed with diabetes ($B=1.5, p=.04$) and feeling that one's diabetes is out of control ($B=1.7, p=.03$) were significantly associated with an increase in perceived risk of kidney disease.

Discussion

This study looked at self-reported risk of kidney disease in a primarily African-American community sample in Central Brooklyn, New York. This Brooklyn area is of primary interest, as it is comprised of minority populations, has high rates of poverty, and higher rates of disease. While we were able to capture information from an important population, our sampling strategy limits generalizability. Our survey was given to only those individuals who attended a health fair and were willing to complete it, presenting a potential bias in our sample.

Table 1. Descriptive data of sample.

Variable	Total Sample (n=350)
Age (Years)	
<25	9.1%
25-45	40.9%
>46	50.0%
Gender	
Male	28.6%
Female	71.4%
Ethnicity	
African American	77.7%
Hispanic	9.8%
Caucasian	4.6%
Asian	1.0%
Other	6.9%
Medical History (reported physician diagnosis)	
Hypertension	34.0%
Diabetes	14.9%
Kidney Disease	4.0%
Family Medical History	
Hypertension	60.3%
Diabetes	45.1%
Kidney Disease	7.1%

Table 2. Factors predicting increased perceived kidney disease risk.

Do you consider yourself to be at increased risk for kidney disease?

Predictor	Beta (β)	Degrees of Freedom	Significance
Family history of kidney disease	1.12	1	.11
Family history of hypertension	1.01	1	.15
Family history of diabetes	.823	1	.22
Physician diagnosed hypertension	.276	1	.64
Physician diagnosed diabetes	1.55	1	.04*
Hypertension is out of control	.778	1	.87
Diabetes is out of control	1.74	1	.03*

* $p < .05$

Furthermore, our reliance on self-report data may have also potentially introduced a response bias.

Some of our population rates for various diseases were higher than the national average. Specifically, the rate of diabetes was almost double that of the national rate, with 15% of our sample reporting a physician diagnosis compared to approximately 9% [12]. The rate of kidney disease was also twice as high in our population, with 4% reporting a physician diagnosis of kidney disease compared to approximately 2% across the nation [13]. 34% of our sample reported a diagnosis of hypertension, with the national average reported to be around 32.5% [13]. Although high, the rates of diabetes and hypertension identified are in line with the high rates that are endemic to Central Brooklyn [12,14].

A significant portion of our sample reported not feeling in control of their respective diseases. Specifically, only half of those with high blood pressure felt in control of their hypertension. Furthermore, 63% of diabetics and 78% of patients with kidney disease did not feel in control. Managing a chronic disease can be unpredictable [15] and can lead to a sense of loss of control [16]. Lack of control of illness may potentially be related to non-adherence [17].

While the percentage of individuals who view themselves at increased risk for various diseases was relatively low, those with a family history of hypertension and diabetes were more likely to consider themselves at increased risk for the diseases compared to those without a family history. However, those with a family history of kidney disease were not more likely to view themselves at increased risk for renal impairment compared to those without a family history of kidney disease. Furthermore, only 7% of those diagnosed with hypertension and 10% of those diagnosed with diabetes, considered themselves to be at increased risk for renal impairment. In fact, only diabetes and feeling its management is out of control emerged as predictors of increased kidney disease risk in our multi-factorial model.

While the under-recognition of kidney disease risk is dramatic, it is not unprecedented. One possible explanation for the low perceived risk for kidney disease may be due to the “silent nature” of early kidney disease expression. While the consequences of cardiac disease and diabetes are well known, glomerular filtration rate and its implications for kidney disease is less part of the cultural vernacular. The complications of cardiac disease and diabetes are more acute, whereas symptoms of kidney disease are often silent, and the slow progression of the disease can make it unnoticeable to the individual.

The link between diabetes and kidney disease seems to be more known in the community than the association between hypertension and kidney disease. Consistent with the Health Belief Model, it is understandable why the risk factor with a lack of acute symptomatology would not result in a perception of increased risk and susceptibility for kidney disease in our sample.

The health care community that services this high-risk population needs to develop improved community education about renal disease risk factors, create programs designed to aid in the early detection of disease, and develop novel methods of working with community members to feel more in control of managing their health care, to minimize disease progression and maximize overall health and quality of life.

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