Cardiovascular Risk Factor Screening Satisfaction in the Heart of New Ulm Project

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Objective: Community-based cardiovascular disease (CVD) risk factor screening programs have been used successfully in rural health improvement initiatives. However, little is known about what consumers like or dislike about them, which is a barrier to the design of future process improvements. The objective of this study was to examine the degree to which health risks and participant characteristics predicted screening satisfaction.

Design: This study utilized a cross-sectional survey design.

Setting: Data was collected as part of the broader Heart of New Ulm Project, which is a community-based CVD prevention demonstration project based in rural Minnesota.

Participants: There were 126 randomly invited individuals from the CVD risk factor screenings, with 118 individuals who agreed to participate and had complete data available for analyses.

Methods: A multivariate logistic regression analysis was used to examine the association between demographics, lifestyle, and biometric risk factors and screening satisfaction.

Results: Twenty percent of respondents indicated some level of dissatisfaction with the screening process. Satisfied participants were more likely to be female (OR=4.15), not have an optimal lifestyle (OR=3.47), and have an intention to improve their lifestyle habits (OR=3.26). Age, education, and CVD risk level were not significant predictors in the final model.

Conclusion: Satisfaction was high in this screening program, with healthy males being least satisfied with their experience. This has implications for the design of future intervention efforts, as they may require specific programmatic features and more specialized, targeted marketing strategies to attract a broad spectrum of participants likely to benefit.

Keywords: Cardiovascular diseases; Mass screening; Patient satisfaction; Risk factors; Rural health

Despite the progress in reducing cardiovascular disease (CVD) mortality over the last 40 years,¹ CVD incidence rates have largely remained stable in rural areas;^{2,3} thus there remains a need to improve control of CVD risk factors. Perhaps because rural communities generally have poorer access to primary care,^{4,5} community-based CVD risk factor screening programs have demonstrated some evidence of benefiting rural adults indicated for CVD preventive medical therapies (eg, aspirin, statin).⁶ Risk factor screenings for CVD generally involve community residents attending an

event at a local community center (eg, clinic, church, school) to have their risk factors measured and receive personalized advice and/or medical referrals to improve their health. The overarching logic for such programs is that improved awareness of CVD risk factors empowers individuals to take action or receive more advanced preventive medical care.

Engaging many community residents to participate in a given CVD risk factor screening program may improve their population level impact. Individuals or groups who are

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Table 1. Health characteristics of respondents in the Heart of New Ulm project screening satisfaction survey (N=118).

Health characteristics	n (%)
Cardiovascular disease risk level	
High risk	12 (10)
Less than high risk	106 (90)
Metabolic syndrome	
Present	33 (28)
Absent	85 (72)
Optimal lifestyle	
Yes	12 (10)
No	106 (90)
Perceived stress score (points, mean±SD)	3.9 ± 2.7
Intention to improve lifestyle habits	
Yes	56 (47)
Maybe or no	62 (53)

community-oriented screenings (one at a community center and the other at the local medical center) and two were large worksite-oriented screenings (one with primarily labor occupations and the other with primarily desk occupations). The community sites were open to all adult residents and tended to attract a slightly older, higher-risk group of participants. The workplace sites were open to adult employees and spouses, and tended to attract slightly younger participants. One screening was held on a weekend and the other three on weekdays.

Following collection of each participant's screening measures, a satisfaction survey and brief face-to-face interview were administered immediately. At the beginning of each 10-minute time interval during a screening, the first individual to complete the screening and exit the site was invited to complete the satisfaction survey/interview. Selected individuals were administered the survey immediately, and it was completed within 10 minutes.

Measures

Primary dependent measures included satisfaction with the screening program. As outlined in figure 1, the screening satisfaction survey was a 10-item questionnaire divided into two sections. The first section included seven closed-ended satisfaction questions using five-point response options. The second section was comprised of three semi-structured qualitative interview questions. This section was open-ended and sought to evaluate detailed reasons why individuals decided to participate in the screening, recommended changes to improve the screening process, and participants' intentions following the screening. Participants were encouraged to freely express their reservations or approval of the entire process. Qualitative responses were transcribed verbatim. Predictor variables were selected based on their suspected potential to influence satisfaction with the screening program. These variables were measured as part of the screening survey and included:

- *Demographics* – Self-reported age, sex, and education level (collapsed into college degree or no college degree).
- *CVD risk level* – A Reynolds Risk Score was calculated for each individual.^{10,11} This estimates an individual's 10-year probability of experiencing a CVD event (eg, myocardial infarction, revascularization). It takes into account age, sex, smoking, systolic blood pressure, total cholesterol, high-density lipoprotein (HDL) cholesterol, and high sensitivity C-reactive protein.
- *Metabolic syndrome* – Metabolic syndrome was defined as the presence of at least three of five health conditions, including:¹² (1) systolic blood pressure ≥130 mm/Hg, or diastolic ≥85 mm/Hg, or current high blood pressure medication; (2) waist circumference ≥40 inches (male) or ≥30 inches (female); (3) HDL cholesterol <40 mg/dL (male) or <50 mg/dL (female); (4) triglycerides ≥150 mg/dL; and (5) blood glucose ≥100 mg/dL or current glucose control medication.
- *Optimal lifestyle* – Optimal lifestyle was designated as having each of the following five characteristics: (1) non-smoker; (2) ≥150 min/wk of moderate physical activity; (3) 0 to 14 alcoholic drinks/wk; (4) ≥5 servings of fruits/vegetables daily; and (5) body mass index (BMI) <30 kg/m². This designation was based on previous research by Khaw et al.¹³
- *Perceived stress* – Stress was assessed using the short version of the Perceived Stress Scale.¹⁴ This included four items that capture feelings about the magnitude of life challenges as well as personal stress management abilities over the past month. An index score between 0 and 16 points is created by summing the four 4-point response options.
- *Intention to change* – Intention to change was assessed via a single-item question asking if participants intended to improve their lifestyle habits over the next six months. Responses were yes, maybe, or no (collapsed to yes or no/maybe).

Analysis

Each individual was assigned to one of two categories based on their response pattern to the first section of the survey. Participants who responded “satisfied”, “very satisfied”, “probably would”, or “definitely would” to all seven questions in the first (quantitative) section of the satisfaction survey were categorized as “satisfied”. All other participants were categorized as “not satisfied”. Responses are often skewed in satisfaction surveys, and the dichotomization of the outcome variable in this study was done to create a more conservative characterization of screening approval. Essentially any indication of less-than-complete satisfaction, even a response of “neutral” or “maybe” on one item, was deemed “not satisfied” for analytical purposes.

The association between satisfaction and the predictor variables was examined using multiple logistic regression (PROC LOGISTIC; SAS Version 9.2, Cary, NC). All

Table 2. Satisfaction of risk factor screening procedures in the Heart of New Ulm project (N=118).

Screening procedure satisfaction	n (%)
Overall screening	
Very satisfied	69 (58)
Satisfied	40 (34)
Neutral	1 (1)
Dissatisfied	1 (1)
Very dissatisfied	7 (6)
Survey	
Very satisfied	54 (46)
Satisfied	56 (47)
Neutral	3 (3)
Dissatisfied	0 (0)
Very dissatisfied	5 (4)
Blood pressure	
Very satisfied	64 (54)
Satisfied	44 (37)
Neutral	3 (3)
Dissatisfied	4 (3)
Very dissatisfied	3 (3)
Venipuncture	
Very satisfied	69 (58)
Satisfied	39 (33)
Neutral	6 (5)
Dissatisfied	0 (0)
Very dissatisfied	4 (3)
Coaching	
Very satisfied	64 (54)
Satisfied	47 (40)
Neutral	3 (3)
Dissatisfied	1 (0)
Very dissatisfied	3 (3)
Recommend screening to others	
Definitely would	90 (76)
Probably would	25 (21)
Maybe/maybe not	2 (2)
Probably not	0 (0)
Definitely not	1 (1)
Attend screening again	
Definitely would	86 (73)
Probably would	30 (25)
Maybe/maybe not	0 (0)
Probably not	1 (1)
Definitely not	1 (1)

predictors were considered for inclusion into the final regression model. Predictors were initially entered into the model simultaneously, and manual, backwards selection criteria were applied that retained predictors with $P < 0.10$. This threshold of statistical significance was used due to the exploratory nature of this study and the fact that it utilized observational data. Effect modification was not examined due to the small sample size.

Responses to the open-ended questions were analyzed using a general inductive, qualitative approach.¹⁵ Specifically, responses were jointly reviewed several times by the first and second authors, and overlapping comments were coded into

agreed upon common themes (descriptive categories) that emerged based on the interview texts. From this coding scheme, the most common reoccurring themes were inductively developed that reflected participants' main attitudes toward their screening experience.

Results

Descriptive characteristics of the analytical sample are outlined in table 1. No significant differences were observed between respondents (n=118) and non-respondents (n=6) (non-respondents' data not shown). As expected, satisfaction was quite high with over 90% of respondents reporting they felt very or somewhat satisfied with each of the given screening procedures (table 2). The venipuncture procedure was the least satisfying component of the screening process. Overall, 24 participants (20%) indicated at least some level of dissatisfaction on one or more items, whereas the remaining 94 participants (80%) indicated complete satisfaction across all items.

The final multivariate regression model revealed that the adjusted odds of being in the "satisfied" analytical category was significantly higher among participants who were female (OR=4.15 [1.49, 11.60], $P=0.007$), did not have an optimal lifestyle (OR=3.47 [0.79, 15.14], $P=0.098$), and intended to change their lifestyle (OR=3.26 [1.08, 9.87], $P=0.036$). The final multivariate regression model with all included beta terms and directions of associations is summarized in table 3.

Responses to the semi-structured interview questions were grouped into four major themes, including: (1) community engagement; (2) personal health concerns; (3) financial value; and (4) peer/family support. More specifically, the most common indications associated with each theme related to why people chose to participate in the screening were (respectively): (1) "I wanted to show support for my community's project"; (2) "I care about my health"; (3) "The screening was free"; and (4) "I was strongly encouraged by my employer, friends, and/or family." The most commonly recommended changes to the screening process were: more streamlined organization of proceeding through measurement stations, more privacy during sensitive activities like weigh-ins and coaching, and expanded days/times available for screenings. The most commonly reported behavior change intentions in response to the screening were to eat healthier, exercise more, and/or try to influence family members or friends to improve their health. However, few participants expressed certainty or extensive detail as to whether or not (or how) they would make healthy changes as a result of participating in the screening.

Discussion

Very little is known about what consumers like or dislike about community-based CVD risk factor screening programs. In the HONU Project, satisfaction with the overall screening experience was high. The general profile of participants that

Table 3. Final multivariate logistic regression model of the association between screening satisfaction and significant predictors in the Heart of New Ulm Project (N=118).

Model predictors	Satisfied (vs. Dissatisfied)				
	β^*	SE	OR	CI	P
Intercept	-3.05	0.59	---	---	<0.001
Female (ref = male)	1.42	0.52	4.15	1.49-11.60	0.007
Optimal lifestyle, no (ref = yes)	1.24	0.75	3.47	0.79-15.14	0.098
Intention to improve lifestyle, yes (ref = maybe or no)	1.18	0.56	3.26	1.08-9.87	0.036

* β values are equal to the (natural) logarithmic odds ratio of being satisfied relative to being dissatisfied. Positive values indicate that the predictor variable has higher odds of satisfaction relative to the reference category.

were most satisfied with their screening experience was that of females with several lifestyle risk factors and an expressed intention to improve their health over the ensuing six months. The latter two predictors were perhaps most encouraging in the sense that they represent groups who were both pleased with and had a presumably high propensity to benefit from the screening (ie, poor lifestyle habits but desire to improve them). These findings conflicted somewhat with those of other studies where participants with better physical functioning and optimal lifestyle were actually more likely to be satisfied with preventive healthcare services.^{16,17} Others have also found that satisfaction with post-CVD medical services (some of which overlap with a CVD risk factor screening) is associated with older age and more education,^{17,18} but these factors were relatively weak in the current study.

In contrast, males with an optimal lifestyle were least likely to feel satisfied with their screening experience. At least some of these sentiments seemed to be due to social pressures. The HONU Project operates across the entire community, and many participants in the qualitative interview reported being strongly encouraged to take part in the screening by an employer, coworker, or family member. This seemed to be particularly predominant among married males, who often cited spousal influence as a motivation for participation. A similar reason may explain the dissatisfaction among participants who reported an optimal lifestyle, yet still spent 20 to 30 minutes going through a screening process they may have personally felt was unnecessary for them (but participated anyway due to perceived pressure from others). This phenomenon may have implications for future intervention efforts as part of the HONU Project in that more specialized, targeted marketing strategies may be needed to engage a subset of healthy males in, perhaps, a health maintenance program.

The primary limitations of this study were the cross-sectional design and the relatively small sample that had limited power to detect some associations. The sample was fairly representative of the target population of all screened individuals due to the systematic selection process and high response rate. Indeed, the distribution of participants' demographic characteristics closely mirrored those observed in the broader HONU project (data not shown); thus selection

bias seemed unlikely, but widespread generalizability beyond Midwestern rural communities may be limited due to the racially homogenous nature of the study setting. The immediate administration of the satisfaction survey after screening likely helped minimize recall bias, but other measurement biases could have been at play, because most variables were self-reported and thus could have been subject to acquiescence and gratitude biases, as is sometimes found in face-to-face satisfaction interviews.^{19,20}

Conclusion

The findings from this evaluation were encouraging overall in that the vast majority of participants from this rural community reported a high degree of satisfaction with their CVD screening experience, which occurred outside of the traditional clinic environment and workflow. In addition, despite some dissatisfaction with some procedures, only two participants indicated that they would not participate in such a screening again, if available. This overall positive sentiment may bolster future recruitment efforts in follow-up health improvement programming associated with the HONU Project. However, further investigations are needed in larger, more diverse samples to confirm the findings in this analysis and identify other predictors of satisfaction within CVD screening programs, as well as potential demographic disparities in screening participation.

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