

Employer, purchasing group, and vendor characteristics associated
with depression product purchasing behavior

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Introduction. Recent studies have shown that major depression can have a significant negative impact in the workplace, resulting in both increased absenteeism (Stewart et al. 2003) and reduced productivity at work (Kessler et al. 2006; Stewart et al. 2003). Given the relatively high annual prevalence of major depression in the workplace (Birnbaum et al. 2010) and the existence of interventions for depression that increase workplace productivity and provide a positive return on investment of these interventions (LoSasso, Rost, and Beck 2006; Rost et al. 2011; Rost, Smith, and Dickinson 2004), employers should be interested in purchasing evidence-based depression products. However, many employers still choose to not invest in products designed to offer high quality depression treatment to their employees, even when they are presented with materials demonstrating the positive return on investment of these products (Rost et al. 2013). If rates of uptake of products to improve depression treatment are to occur among employers, effective methods to change employer purchasing behavior are needed. In order for this to occur, it is helpful to understand what employer characteristics are associated with purchasing of these depression products so that tailored interventions can be designed. The purpose of this study was to assess what organizational, purchasing group, and vendor characteristics were associated with employers' decisions to purchase or consider purchasing a depression product for their employees.

Sample. The data used for this analysis was originally collected as part of a randomized control trial to assess whether evidence-based presentations that demonstrated a positive return on investment of depression products resulted in increased depression product purchasing behavior (Rost and Marshall 2010). A total of 325 employers participated in the original study. As part of the study, interviews were conducted with employers at baseline to assess characteristics of the organization, as well as follow-up interviews at 12 months and 24 months after the presentation to assess depression product purchasing behavior. Employers were eligible for inclusion if they were members of the National Business Coalition on Health, provided health insurance to their employees, have at least 100 employees, and had not previously purchased depression products for their employees in the two years prior to the presentation. The regression analysis included only those firms that responded to all organizational, purchasing group, and vendor characteristics questions on the surveys (N=275).

Measures. The dependent variable is an ordinal variable ranging in value from 1 to 4 (1=attended presentation only; 2 = internal or external discussion about purchasing; 3 = external and internal discussion of purchasing; and 4 = purchased depression product). Purchasing was assessed at baseline, twelve months and twenty-four months. The purchasing variable used as the dependent variable represented the highest level of purchasing indicated in any of the three waves of the survey. Characteristics were categorized into three groups: organizational characteristics, purchasing group characteristics, and vendor characteristics. Organizational characteristics included firm size (100-500 employees, 501-2500 employees, >2500 employees), firm type (for profit, not for profit, public sector), number of years the oldest part of the firm has been in business, total number of employment sites with at least 100 employees, firm's willingness to take on risk with employee benefits, and firm's health benefit generosity (number of health benefits offered). Purchasing group characteristics included whether benefit decisions were made at the local site level or were centralized, whether influence over purchasing decisions had to do with the person's position or who they knew in the organization, and the size of the group that makes the purchasing decisions. The vendor characteristic included whether the firm was working with an old or new vendor. Separate analyses were run with and without an

indicator to control for whether the employer received the evidence based presentation or the usual presentation. The results were similar for both analyses, thus the analysis without the intervention variable is presented.

Analysis. Because the dependent variable is an ordered categorical variable, ordered logistic regression was used to assess the association of organizational, purchasing group, and vendor characteristics on purchasing behavior. To assess the relative role of these three types of characteristics, four separate random effects ordered logistic regression models were estimated. The first model only included organizational characteristics, the second model included only purchasing group characteristics, the third model included only vendor characteristics, and the fourth model included all characteristics together in a single model. Pseudo R^2 statistics indicated the proportion of the variance in purchasing behavior explained by each of the three types of characteristics. In the combined model, Wald chi-square tests were conducted to test composite linear hypotheses for each grouping of variables (organizational, purchasing group, vendor) to assess the probability that the set of coefficients were jointly equal to zero. These Wald tests indicated which group of characteristics was most significantly associated with purchasing behavior. All analyses were conducted using Stata Version 13.

Results. Demonstration of purchasing behavior was fairly limited in the study sample. Of the 325 employers, 170 (52%) exhibited no purchasing behavior, 40 (12%) discussed purchasing either internally or externally, 80 (25%) discussed purchasing both internally and externally, and 35 (11%) purchased a depression product. When each of the three groups of characteristics were entered into the model separately (Table 1), organizational characteristics jointly explained 4.6% of purchasing behavior, purchasing group characteristics jointly explained 1.9%, while vendor characteristics explained less than 1% of purchasing behavior. In these three models, a few individual characteristics were significantly associated with purchasing behavior. Among organizational characteristics, firm size, willingness to take risk, and health benefit generosity were significant predictors, with smaller firms having significantly lower odds of exhibiting purchasing behavior ($OR=0.430$, $p=.006$) while risk taking firms ($OR=1.69$, $p=.034$) and firms that offered more generous health benefits ($OR=1.11$, $p=.012$) had higher odds of exhibiting purchasing behavior. Among purchasing group characteristics, the variable corresponding to position influence on purchasing was significant, where employers that indicated who you know was more important than position title being significantly less likely to engage in purchasing behavior ($OR=0.635$, $p=.002$). Vendor was not significantly associated with purchasing behavior.

When all covariates were included in a single model (Table 2) and joint significance of the variables corresponding to organizational, purchasing group, and vendor were tested, organizational characteristics were jointly the most significant ($p=.001$), followed by purchase group ($p=.008$), while the vendor variable was not significant ($p=.757$). However, the model overall could only explain about 6.5% of the variance in purchasing behavior. When looking at the individual characteristics in this combined model, three characteristics were significant predictors of purchasing behavior at the $p<.05$ level, with one other variable being marginally significant. Small firms (100-500 employees) and purchasing groups where decisions were based on who you know rather than position, all had significantly lower odds of exhibiting purchasing behavior ($OR=0.471$, $p=.024$; $OR=0.632$, $p=.004$, respectively). Firms indicating more willingness to take on risk exhibited greater purchasing behavior ($OR=1.69$), although significance

was only at the $p=.055$ level. Firms with more generous health benefits had significantly higher odds of exhibiting purchasing behavior (OR=1.126, $p=.009$). While not significant at the $p<.05$ level, firms where purchasing decisions were made at the local level had marginally significantly higher odds of exhibiting purchasing behavior (OR=1.734, $p=.082$) compared to firms with centralized purchasing.

Conclusions. Overall, very little of purchasing behavior could be explained by the included covariates. Although some organizational and purchase group variables were significantly associated with purchasing behavior, most of these characteristics were not something that could actively be acted upon by firms to change purchasing behavior. However, employers that allow benefit purchasing decisions to take place at local sites rather than through a centralized process, could result in more informed purchasing decisions. Unfortunately, these results provide little overall guidance as to interventions to increase purchasing of depression products. To date, there has been scant attention paid to understanding factors associated with employer's decision to purchase health benefits for their employees, although a previous study came to similar conclusions, observing that employers tend to not implement incentives or programs based on value-based purchasing principles (Rosenthal et al. 2007). Given that neither the presentation intervention targeted to individual organizations (Rost et al. 2013), nor most purchasing group and vendor characteristics were significantly associated with purchasing behavior, development of other interventions or policies are necessary to spur employers to make value-based benefit purchasing decisions that not only improve the health of their workforce, but also improve the financial performance of their firms. An additional issue is that often when employers offer disease management programs to their employees, they fail to implement disease management models that have been shown to deliver a return on investment (Rost and Marshall 2010). For example, employers may offer a disease management program that does not include all of the features that have been shown to be necessary to provide a positive return on investment.

While it is still not clear what can be done to convince employers to make value-based purchasing decisions, the framework for disseminating evidenced-based health promotion practice developed by the University of Washington Health Promotion Research Center may be informative (Harris et al. 2012). According to that framework, user organizations must first enter a stage of "readiness" before adopting and implementing programs such as a depression management program. The framework suggests that simple diffusion of information regarding the value may not be enough to result in adoption, and suggests that other methods, such as government intervention, may be the best method (Harris et al. 2012). Therefore, it is possible that policy interventions that incentivize employers to purchase valuebased health care, such as tax breaks for employers who offer evidence-based depression management programs, may be the best mechanism to ensure that American workers have access to high quality, high value health care. Policy interventions such as this can not only improve the quality of life for individual employees, but can also improve worker productivity, which can have positive spillover effects throughout the American economy, and thus also provide a positive return on investment to taxpayers as well.

Table 1: Separate Ordered Logistic Regression Models by Type of Characteristic

	Odds Ratio	P-value	95% Confidence Interval
Organizational Characteristics (N=298)			
Firm size: 100-500	0.43	0.006	0.23-0.79
Firm size: 501-2500	0.85	0.554	0.48-1.47
Firm size: >2500 (reference)	-	-	-
Not For Profit	1.57	0.110	0.90-2.74
Public Sector	1.38	0.305	0.75-2.56
For Profit (reference)	-	-	-
Organization Age	1.00	0.612	1.00-1.01
Number of Sites with 100+ employees	1.00	0.457	1.00-1.00
Willingness to Take Risks	1.69	0.034	1.04-2.78
Health Benefit Generosity	1.11	0.012	1.02-1.21
Purchasing Group Characteristics (N=290)			
Local Benefit Decisions	1.30	0.349	0.75-2.26
Purchase Centralization	0.74	0.519	0.29-1.87
Influence of Purchaser Position	0.64	0.002	0.48-0.84
Purchase Group Size	1.01	0.413	0.98-1.05
Vendor Characteristic (N=325)			
New Vendor	1.47	0.122	0.90-2.38

Table 2: Ordered Logistic Regression with All Characteristics Included (N=275)

	Odds Ratio	P-value	95% Confidence Interval
Organizational Characteristics (Pseudo R²=0.046)			
Firm size: 100-500	0.47	0.024	0.25-0.91
Firm size: 501-2500	0.92	0.788	0.51-1.66
Firm size: >2500 (reference)	-	-	-
Not For Profit	1.55	0.147	0.86-2.79
Public Sector	1.38	0.329	0.72-2.63
For Profit (reference)	-	-	-
Organization Age	1.00	0.466	1.00-1.01
Number of Sites with 100+ employees	1.00	0.429	1.00-1.00
Willingness of Risk Taking	1.69	0.055	0.99- 2.86
Health Benefit Generosity	1.13	0.009	1.03-1.23
Purchasing Group Characteristics (Pseudo R²=0.019)			
Local Benefit Decisions	1.73	0.082	0.93-3.22
Purchase Centralization	0.56	0.266	0.20-1.56
Influence of Purchaser Position	0.63	0.004	0.46-0.86
Purchase Group Size	0.99	0.522	0.94-1.03
Vendor Characteristic (Pseudo R²=0.003)			
New Vendor	1.09	0.757	0.62-1.92

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