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Abstract
Health related quality of life (HRQOL) and self-perceived well-being have been shown to be associated with lower healthcare utilization and costs in people with chronic diseases. A pharmacist-run employee health program started in 2008 sought to improve HRQOL through the use of individualized lifestyle behavior programming, medication therapy management, and care coordination activities. Following one year of participation in the program, employee participant's self-reported general health rating significantly improved compared with their baseline rating (p < 0.001). Participants also reported a significantly lower number of days within a month when they did not feel physically and/or mentally well at baseline vs. one-year, respectively (10.3 days vs. 6.0 days, p < 0.01). Pharmacists can positively impact self-reported HRQOL when working in an employee health setting.

In 1946, the World Health Organization defined health as, "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."[1] Over the past seven decades, however, health has been narrowly measured in the literature mostly through morbidity and mortality outcomes.[2] The quality of an individual's life has only recently become an important and more frequent measure of health.

The Centers for Disease Control and Prevention (CDC) reports that quality of life (QOL) is a broad multidimensional concept that includes both positive and negative aspects of life as perceived by each individual.[2] Quality of life is defined in many different ways by various organizations and can include many different aspects of life.[2] However, the CDC focuses more specifically on health-related quality of life (HRQOL), or the aspects of overall QOL that effect either physical or mental health.[2]

It is known that individuals with chronic diseases and disabilities report lower QOL levels and more unhealthy days compared with individuals without chronic diseases and disabilities.[3] Recently, data have been published to show that a higher level of self-perceived well-being is associated with lower health care utilization and costs in individuals with chronic conditions.[4] This may be particularly important to

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employers as it may affect the overall financial state of an organization. Data exists to show the pharmacists can have a positive impact on the QOL of people with chronic conditions.[5-7] However, the authors could not find any data demonstrating the impact a pharmacist can have on the QOL of individuals in an employee health setting.

The purpose of this analysis is to report the effect that a pharmacist can have on the HRQOL at baseline versus one-year for employees with chronic conditions who participate in a pharmacist-run employee health risk reduction program. Prior to conducting the analysis, the project was submitted to the local Institutional Review Board for approval and oversight. The project was considered to be a continuous quality improvement measure of the employee risk reduction programs, and therefore, oversight was deemed unnecessary.

Methods
Risk Reduction Programs
In 2008, a medium sized university in the Midwestern section of the United States initiated a pharmacist-run employee health Cardiovascular and Diabetes Risk Reduction Program. Employees were eligible to volunteer for the program if they had an existing diagnosis of hypertension, hypercholesterolemia, diabetes mellitus, or a combination, thereof. Employees could participate in the program for as long as they remained employed with the university and obtained their health care benefits from the employer. The primary outcomes of the program were to (1) reduce the risk of experiencing a cardiovascular event within the next 10 years; (2) improve the lifestyle habits of physical activity, healthy eating, stress management, sleeping, alcohol

consumption, and tobacco use; (3) improve medication adherence; (4) improve quality of life; and (5) improve presenteeism (productivity) rates.

Participants in the risk reduction program attended one-on-one appointments with the pharmacist at least one time per month. Monthly visits consisted of medication therapy management activities, implementation and adherence to seven personalized lifestyle medicine programs (physical activity, healthy eating, stress management, restorative sleep, moderate alcohol consumption, tobacco abstinence/cessation, and weight control), and chronic disease education and care coordination practices. Information regarding the care coordination practices within the program has been previously published.[8]

In order to achieve the highest level of program adherence and success, each participant was provided with educational materials, a home blood pressure monitor, a pedometer, lifestyle behavior tracking tools, free access to the employer's exercise facilities, monthly support group meetings, and access to a licensed mental health care provider. Additionally, the employees with diabetes were provided with an initial consultation with a dietitian, six hours of American Diabetes Association approved education classes, and access to point-of-care hemoglobin A1c analyses as needed. Information regarding the interprofessional nature of the program and responsibilities of each care provider has been previously published.[9]

Individual participant data was collected at baseline and annually thereafter. Collected data consisted of cholesterol, blood pressure, and blood glucose lab values, body weight, lifestyle behavior activities, medication refill records, HRQOL questionnaires, and presenteeism questionnaires. With the permission of the participant, additional health information was also obtained from the annual health risk appraisal data collected by the employer and/or from the participants other health care professionals (ie. physician).

Health Related Quality of Life Analysis
The questionnaire that was used in the risk reduction programs to measure HRQOL is the same questionnaire that the CDC has been using since 1993 to measure HRQOL in the Behavior Risk Factor Surveillance System (BRFSS), and since 2000 in the National Health and Nutrition Examination Survey (NHANES) .[10] The set of HRQOL questions is called the "Healthy Days Measures" and include the following:[10]

1. Would you say that in general your health is excellent, very good, good, fair or poor?

2. Now thinking about your physical health, which includes physical illness and injury, how many days during the past 30 days was your physical health not good?

3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, how many days during the past 30 days was your mental health not good?

4. During the past 30 days, approximately how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

Question 1 was converted to numerical values for the analysis. The responses of "poor", "fair", "good", "very good", and "excellent" were recorded as "1", "2", "3", "4", and "5", respectively, in the database for analysis.

To calculate a "Summary Index" of unhealthy days, the CDC has developed a statistically valid procedure and is as follows, "Unhealthy days are an estimate of the overall number of days during the previous 30 days when the participant felt that either his or her physical or mental health was not good. To obtain this estimate, responses to questions 2 and 3 are combined to calculate a summary index of overall unhealthy days, with a logical maximum of 30 unhealthy days. For example, a person who reports 4 physically unhealthy days and 2 mentally unhealthy days is assigned a value of 6 total unhealthy days, and someone who reports 30 physically unhealthy days and 30 mentally unhealthy days is assigned the maximum of 30 total unhealthy days."[11]

Participants
The "Healthy Days Measures" questionnaire was administered to all participants at baseline and annually thereafter. The data reported in this analysis consists of the employees who completed the questionnaire at both baseline and at one year.

Statistical Analysis
The statistical analysis for this project used the Wilcoxon signed-rank test as a non-parametric test to compare the median difference between the two time points. A p value of <0.05 was considered statistically significant.

Results
From August 2008 through May 2012 a total of 80 employees were enrolled in the risk reduction program. Of these individuals, 50 (17 male / 33 female) completed at least one year of participation and had matching HRQOL data collected at baseline and at one year. The average age of the participants at enrollment was 52.4 years with 32 having an

existing diagnosis of hypertension, 35 having hyperlipidemia and 18 having diabetes mellitus type 2. The HRQOL data was analyzed for the group as a whole as well as separately for those with and without diabetes.

Self-Reported General Health Rating
Figure 1 illustrates the results of the participant's self-reported rating of their general health at baseline versus one-year (CDC HRQOL question #1). A statistically significant relative increase from 2.82 to 3.40 (+20.6%, $p < 0.001$) was demonstrated in the overall group. Likewise, the diabetes subgroup demonstrated an increase from 2.39 to 3.00 (+25.5%, $p = 0.013$), and the non-diabetes subgroup increased from 3.06 to 3.63 (+18.6%, $p < 0.01$) from baseline to one-year, respectively.

Additionally, the CDC used data from the 2009 BRFSS to estimate the percentage of Americans who rate their general health as either "fair" or "poor" in question 1 of the "Healthy Days Measures."[12] The results from our analysis at baseline and at one-year are provided in Table 1 along with the results from the 2009 BRFSS, for comparison.[12] A statistically significant improvement was demonstrated for the overall group ($p = 0.039$) and for the diabetes subgroup ($p = 0.031$). The non-diabetes subgroup showed an improvement at one-year that achieved a value that was better than that reported in the 2009 BRFSS, but the change was not statistically significant compared with the baseline value ($p = 0.687$).

Activity Limitation Days
Table 2 provides the data obtained from question 4 of the "Healthy Days Measures" questionnaire that reflects the quantity of days where activity limitation exists due to feeling physically or mentally unwell. The overall group, as well as both subgroups, demonstrated fewer days where activity was limited at one year versus baseline. The relative decrease in days ranged from 45% to over 72%, but the statistical analysis did not demonstrate this to be significant. In each case, however, the number of days where activity was limited at one year was less than that reported in the 2009 BRFSS for the general U.S. population.[12]

Unhealthy Days
Table 3 provides the data from questions 2 and 3 that list the number of self-reported unhealthy days due to feeling unwell physically and mentally, respectively. Improvements were demonstrated in both areas for the overall group and in each of the subgroups. The improvements in the number of physically unhealthy days, however, were not statistically significant, but did achieve values better when compared with the national data.[12] Statistically significant improvements were demonstrated with regard to the

mentally unhealthy days and were likewise at levels better than that reported in the national data.[12]

A combination of questions 2 and 3 are referred to by the CDC as a summary index and provides a statistically valid estimate of the total number of self-reported unhealthy days in the previous 30 days with a logical maximum of 30 days possible.[11] Table 4 lists the total estimated unhealthy days at baseline versus one-year with a comparison to national data. Statistically significant improvements were demonstrated for the overall group as well as each subgroup. Additionally, in each analysis the one-year value was better than compared to that of the national data reported in the 2009 BRFSS. Of note, the baseline value for individuals with diabetes reflect that they feel unhealthy nearly one-half of the days in a month, which decreased to less than one-third after one year.

Discussion
Our analysis showed that a pharmacist-run risk reduction program conducted in an employee health setting for individuals with chronic conditions can significantly improve HRQOL measures after one year of participation and compared with that reported for the general U.S. adult population in the BRFSS. Little data has been published to date that has demonstrates the value of a pharmacist with regards to HRQOL working in a non-medication dispensing role such as an employee health setting.

In addition to the HRQOL quantitative data presented in this analysis, we conducted a focus group session with eight participants to obtain qualitative information. When participants were asked about QOL improvements related to the programs, responses overwhelmingly favored the one-on-one meetings with a pharmacist as the most important aspect of the program that helped them reach their goals related to QOL. Participants articulated that they feel better both physically and mentally overall, have more energy, and feel more in control of their current and future health. Participants with diabetes also responded that the program activities that focused on medication therapy management strategies were particularly helpful in making them "feel better." One participant responded with a quote that is particularly representative of the group. "…the program makes me feel good, and it is what I like to call that new tennis shoe feeling where you feel like you can jump higher and run faster." An additional important point that participants made with regard to QOL is that they feel like the program has had a positive effect regarding how they view their job. One participant stated, "I feel better and believe that this helps me to be more effective on the job. I haven't been sick as frequently as I was before the program, and have

missed less work. I believe I am simply a much better employee because of the program."

Improving employee QOL may be financially important to employers as well. A study published recently demonstrated a positive relationship between an improvement in an employee's feeling of well-being and the effect on health care utilization and costs.[4] Harrison and colleagues found that a statistically significant (p < 0.01) inverse relationship exists between self-reported well-being scores and short-term health care utilization and spending. Employee members of a health care plan (n=2245) were asked to complete a questionnaire that measured well-being on a 100 point scale.[4] When analyzing the health care utilization and spending of these individuals over a 12 month time period, their results showed that for every one point increase on the well-being scale, a 2.2% decrease in hospital admissions was demonstrated.[4] Additionally, every one point increase correlated to a 1.7% decrease in emergency room visits, and respondents were 1.0% less likely to incur any health care costs, in general.[4] Also, for those who did utilize health care resources, individuals with higher well-being scores spent significantly less money compared to those with lower well-being scores (p < 0.01) which saved the organization money.[4] These results lend evidence to the importance of improving QOL in an employee health setting with regard to its positive financial impact.

Our analysis did not directly measure health care utilization and spending for those who participated in the risk reduction program. Therefore, cost savings due to improvements in HRQOL cannot be directly reported in this analysis. Data from this analysis show fewer unhealthy days after one year of participation in the program which may have a positive effect on employee absenteeism and productivity levels.

It should be noted that when comparing our data to that in the BRFSS, we did not compare our risk reduction participants to a matched cohort in the BRFSS, and therefore exact comparisons were not conducted. However, the values reported for the general U.S. population in the BRFSS included those of individuals without chronic conditions, whereas our analysis only included individuals who had at least one chronic condition (hypertension, hypercholesterolemia and/or diabetes mellitus). The CDC reports that Americans with chronic diseases and disabilities experience more unhealthy days compared to those without diseases and disabilities.[3] Overall, our data showed that after one year of participation in a risk reduction program, the number of self-reported unhealthy days in the previous 30 days was less than that reported in the BRFSS for the general

population that included individuals with and without chronic conditions.

The idea of placing a pharmacist in an employee health setting is novel and little is known about the effect a pharmacist can have in this practice setting. Direct health outcomes are important to measure in any practice, but the worksite has additional measures that may be equally as important such as QOL, absenteeism, productivity and others. Limiting measured outcomes to only direct health related data is a narrowly viewed focus and does not capture the spirit of what it means to be healthy as defined by the WHO in 1946.[1] Employers are increasingly more interested in the greater view of health of its employees, because it may have significant financial implications related to employee health care expenditures, but also productivity and absenteeism costs. A pharmacist working in an employee health care setting may have a positive financial impact on the organization in the absence of dispensing medications. Pharmacists working in an employee health setting may be able to improve the health of employees and the financial situation of the organization through activities such as individual employee medication therapy management, lifestyle medicine related activities, and helping employees coordinate their health care needs. Other opportunities for pharmacists in this type of setting may include educating employees on medical self-care topics, working with the employer on their drug formulary, and providing immunizations to employees.

Conclusion
Quality of life is an important part of an individual's health and well-being. Pharmacists may be able to have a significant and positive impact on the health related quality of life of individuals who participate in a pharmacist-run employee risk reduction program for employees with chronic diseases. The impact of a pharmacist working in this setting may have positive financial implications for the employer while producing positive health and well-being outcomes for the employees.

References

1. World Health Organization. WHO Definition of Health. Available at: http://www.who.int/about/definition/en/print.html. Accessed on July 23, 2012.

2. Centers for Disease Control and Prevention. Health Related Quality of Life. HRQOL Concepts. Available at: http://www.cdc.gov/hrqol/concept.htm. Accessed on July 23, 2012.

3. Centers for Disease Control and Prevention. Health Related Quality of Life. Key Findings. Available at: http://www.cdc.gov/hrqol/key_findings.htm. Accessed on July 23, 2012.

4. Harrison PL, Pope JE, Coberley CR, Rula EY. Evaluation of the relationship between individual well-being and future health care utilization and cost. Population Health Management. 2012;15:1-6.

5. Pickard AS, Johnson JA, Farris KB. The impact of pharmacist interventions on health related quality of life. Annals of Pharmacotherapy. 1999; 33(11):1167-1172.

6. Zillich JA, Ryan M, Adams A, Yeager B, Farris K. Effectiveness of a pharmacist-based smoking-cessation program and its impact on quality of life. Pharmacotherapy. 2002;22(6):759-765.

7. Capoccia KL, Boudreau DM, Blough DK, Ellsworth AJ, Clark DR, Stevens NG, Katon WJ, Sullivan SD. Randomized trial of pharmacist interventions to improve depression care and outcomes in primary care. American Journal of Health Systems Pharmacy. 2004;61(4):364-372.

8. Lenz TL. The ambulatist: A health care professional specializing in lifestyle medicine for chronic disease care coordination. American Journal of Lifestyle Medicine. 2010;4(2):134-137.

9. Lenz TL, Gillespie ND, Skrabal MZ, Faulkner MA, Skradski JJ, Ferguson LA, Pagenkemper JJ, Jorgensen D. Using employee experts to offer an interprofessional diabetes risk reduction program to fellow employees. Journal of Interprofessional Care. 2012; Early online: 1-3. doi:10.3109/13561820.2012.721816

10. Centers for Disease Control and Prevention. Health Related Quality of Life. CDC HRQOL-14 "Healthy Days Measure." Available at: http://www.cdc.gov/hrqol/hrqol14_measure.htm. Accessed on July 23, 2012.

11. Centers for Disease Control and Prevention. Measuring Healthy Days. Atlanta, Georgia: CDC, November 2000.

12. Centers for Disease Control and Prevention. Health Related Quality of Life. HRQOL Tables and Maps. Available at: http://www.cdc.gov/hrqol/data.htm. Accessed on August 9, 2012.

Table 1. Percentage of participants rating "fair" or "poor" self-reported health at baseline vs. one-year and compared with national data.

	*Baseline, %	*One-Year, %	Actual Difference (p value)	†National, %
Overall	28.0	12.0	-16.0% (p = 0.039)	15.9
Diabetes	50.0	16.7	-33.3% (p = 0.031)	45.0
Non-Diabetes	15.6	9.4	-6.2% (p = 0.687)	13.0

*n for Overall, Diabetes Subgroup and Non-Diabetes subgroup are 50, 18 and 32, respectively
†2009 Behavior Risk Factor Surveillance System, Reference #12

Table 2. Activity limitation days in the last 30 days at baseline vs. one-year and compared with national data.

	*Baseline, days	*One-Year, days	Actual, Relative Difference (p value)	†National, days
Overall	3.3	1.5	-1.70, -53.8% (p = 0.081)	2.3
Diabetes	6.3	3.4	-2.81, -45.0% (p = 0.293)	5.0
Non-Diabetes	1.7	0.5	-1.22, -72.2% (p = 0.160)	2.0

*n for Overall, Diabetes Subgroup and Non-Diabetes subgroup are 50, 18 and 32, respectively
†2009 Behavior Risk Factor Surveillance System, Reference #12

Table 3. Self-reported physically and mentally unhealthy days in the last 30 days at baseline vs. one-year and compared with national data.

	*Baseline, days	*One-Year, days	Actual, Relative Difference (p value)	†National, days
Physically Unhealthy Days				
Overall (n=50)	4.3	2.9	-1.4, -33.2% P = 0.244	3.6
Diabetes (n=18)	8.1	5.1	-3.0, -37.0% P = 0.312	8.1
Non-Diabetes (n=32)	2.1	1.6	0.5, -25.4% P = 0.539	3.2
Mentally Unhealthy Days				
Overall (n=50)	7.0	3.4	-3.6, -51.1% P < 0.01	3.5
Diabetes (n=18)	8.4	4.5	-3.9, -46.4% P = 0.001	4.7
Non-Diabetes (n=32)	6.2	2.8	-3.4, -54.9% P = 0.015	3.4

*n for Overall, Diabetes Subgroup and Non-Diabetes subgroup are 50, 18 and 32, respectively
†2009 Behavior Risk Factor Surveillance System, Reference #12

Table 4. Total estimated unhealthy days in the previous 30 days at baseline vs. one-year and compared with national data.

	*Baseline, days	*One-Year, days	Actual, Relative Difference (p value)	†National, days
Overall	10.3	6.0	-4.3 days, -42.5% (p < 0.01)	6.2
Diabetes	14.4	8.9	-5.5 days, -38.1% (p = 0.035)	9.9
Non-Diabetes	8.0	4.4	-3.6 days, -45.0% (p = 0.014)	5.1

*n for Overall, Diabetes Subgroup and Non-Diabetes subgroup are 50, 18 and 32, respectively
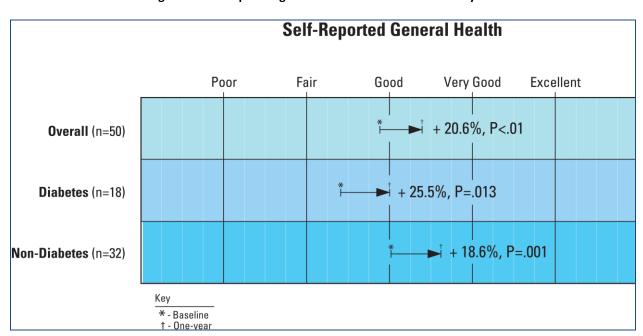†2009 Behavior Risk Factor Surveillance System, Reference #12

Figure Legend
Figure 1. Self-reported general health at baseline vs. one-year.