

Barriers to Physical Activity Among Military Hospital Employees

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Much of the world faces a growing obesity epidemic.^{1,2(pp92-97)} The consequences of this serious problem are well established and potentially devastating. Conditions associated with an elevated body mass include diabetes, hypertension, coronary heart disease, and certain malignancies.^{2(pp97-100),3} For many, obesity and elevated body mass are a consequence of decreased physical activity; industrial advancements (eg, convenient transportation, technological advancements, and decreased need for manual labor) have contributed to an overall decrease in physical activity worldwide.⁴

Multiple studies have examined the reasons for becoming physically inactive, as well as the perceived barriers to activity and overall wellness.⁵⁻¹⁰ Common barriers include lack of time, inexperience with exercise, and lack of motivation.^{5,6,8-10} Although barriers to wellness and physical activity can affect anyone, certain professions demand an inherently more difficult work schedule that can itself be an obstacle to good health. Healthcare providers often have nontraditional work schedules and cite their challenging schedule as a barrier to healthy behavior.⁸ These issues are magnified in the United States, as the American workweek for all industries is already longer than other wealthy industrialized countries and employees are more likely to work odd and/or weekend hours.¹¹ Long shifts, odd hours, and atypical schedules that are common among healthcare workers are barriers that logically detract from their ability to be physically active, beyond that which is required for their employment.

Before policy change can occur, leaders must understand if and how barriers to physical activity affect their specific population. Researchers have studied barriers in various settings, including corporate and healthcare worksites, but there is sparse evidence about how barriers affect those working at military hospitals.^{8,12} Military hospitals are unique in that employees may be active duty military members, civilian employees, or contractors. Each employee type has different training requirements and benefits.

In order to better inform military hospital leadership, the purposes of this study were to describe the common barriers to physical activity for employees at a military hospital, and investigate the association of barriers to physical activity with subjects' perception of personal health status.

METHODS

The health promotion team at a 42-bed military hospital with 1,147 military and civilian staff* and a large catchment area serving approximately 39,900 beneficiaries investigated current barriers to physical, nutritional, and spiritual wellness as part of the development of an employee wellness program. In the summer of 2014, the team designed a survey to gather this information in partnership with the Army Public Health Center (APHC). The Injury Prevention Division at the APHC designed the electronic survey using Verint Enterprise Edition software (Melville, NY) and provided a secure link through which employees could access the survey. The study was approved by the APHC Public Health Review Board as public health practice and a data use agreement was formally put in place between the hospital team and APHC. The study was later presented to the Institutional Review Board at the University of North Carolina, which concurred that the investigation did not constitute human research.

The survey was intended to be inclusive of all hospital employees. There were no prerequisites to completing the survey and participation was anonymous and optional.¹³ Availability of the survey was announced via digital daily announcements, verbal advertisement to large groups of employees, word of mouth, and specific emails to the staff from hospital executives. The survey was open for a total of 45 days from October to December 2014.

In order to gain a true perspective of the holistic wellness state of hospital employees, subject matter experts

*As of November 2014: 420 (37%) active duty military personnel, 727 (63%) Department of the Army civilian employees.

in the hospital from public health, physical therapy, dietetics, social work, and religious departments submitted survey questions related to wellness. Although the focus of this article is on responses regarding barriers to physical activity and perceived health, the survey included 49 total questions regarding health behaviors and obstacles to wellness.

The survey team took measures to be as inclusive as possible, but also as efficient as possible. When asked about barriers to healthy behaviors, respondents were instructed to mark all barriers that applied to them. The survey contained predetermined response options with an “other” category to capture write-in responses. To

improve speed and efficiency, certain questions were not presented to the participant if it was appropriate for that person to skip those questions, based on previous responses. The average time to complete the survey was 17 minutes.

Following survey closure, researchers cleaned the data and, when possible, categorized responses where participants marked “other.” From January through March of 2015, data were analyzed using IBM SPSS, version 19 (IBM Corp, Armonk, NY). Initial categorization of data was by state of perceived wellness and stratified by age range and military affiliation. Military affiliation was delineated by military rank, and healthcare occupational specialty was included as a category. Specific barriers to physical activity were highlighted along with the percentage of respondents who indicated that the specific barrier affected their level of physical activity.

Chi-square analysis was performed on individual barriers to physical activity with the dichotomized dependent variable of perceived health. This variable was determined by the answer to the required question “Do you perceive yourself as being healthy?” with the possible answers of “Yes” or “No.” Statistical tests of factors associated with perceived lack of health (ie, “no” responses) were evaluated at the alpha 0.05 level.

Univariate logistic regression was then conducted, examining the association of the number of reported barriers with the dichotomous dependent variable of perceived health. The number of variables was a count based on the number of affirmative answers the participant marked when asked about various types of barriers.

Finally, multiple logistic regression was performed to assess the relationship between a greater number of barriers and perceived health, controlling for demographic variables that were found to be associated with perceived health in the previous univariate logistic regression analyses.

RESULTS

The survey population (N=380) was primarily active duty personnel (officer and enlisted) and government civilians (Table 1). There was minor representation of government contractors and retired military serving as hospital volunteers, identified as “other.” Predominant population subgroups: women (56%); age group 26-39 years (47%); and government civilians (45%). The

Demographic	Military Personnel n ₁ =205 (%n ₁)	DOA* Civilian Employees n ₂ =169 (%n ₂)	Other† n ₃ =6 (%n ₃)	All Respondents N=380 (%N)
Sex				
Female	71 (35%)	141 (83%)	2 (33%)	214 (56%)
Male	134 (65%)	28 (17%)	4 (67%)	166 (44%)
Age, years				
18-25	32 (16%)	1 (1%)	1 (17%)	34 (9%)
26-39	109 (53%)	34 (20%)	2 (33%)	145 (47%)
40-54	61 (30%)	76 (45%)	1 (17%)	138 (36%)
55 or older	3 (2%)	58 (34%)	2 (33%)	63 (17%)
Military Affiliation				
Enlisted	118 (58%)	-		118 (31%)
Officer	87 (42%)	-		87 (23%)
DOA civilian	-	169 (100%)		169 (45%)
Other	-	-	6 (100%)	6 (2%)
Education				
High school or GED	49 (24%)	37 (22%)		86 (23%)
Associate's	39 (19%)	41 (24%)		80 (21%)
Bachelor's	42 (21%)	39 (23%)	2 (33%)	83 (22%)
Master's or Doctorate	65 (32%)	33 (20%)	4 (67%)	102 (27%)
Other professional degree	10 (5%)	19 (11%)		29 (8%)
Occupation				
Nurse	31 (15%)	30 (18%)		61 (16%)
Physician	22 (11%)	1 (1%)		23 (6%)
Medic	47 (23%)	3 (2%)		50 (13%)
Technician	18 (9%)	19 (11%)	1 (17%)	38 (10%)
Pharmacy	3 (2%)	5 (3%)		8 (2%)
Other medical profession‡	62 (30%)	13 (8%)	2 (33%)	77 (20%)
Administration	14 (7%)	39 (23%)		53 (14%)
Other nonmedical or unspecified	8 (4%)	59 (35%)	3 (50%)	70 (18%)

*DOA indicates Department of the Army.
†Contract employees and volunteers (retired military).
‡This category includes clinical providers who could not be grouped into broad categories (eg, behavioral health professionals, physical therapists, and dentists).

survey was largely representative of clinical staff with 86% of those surveyed employed in direct clinical care.

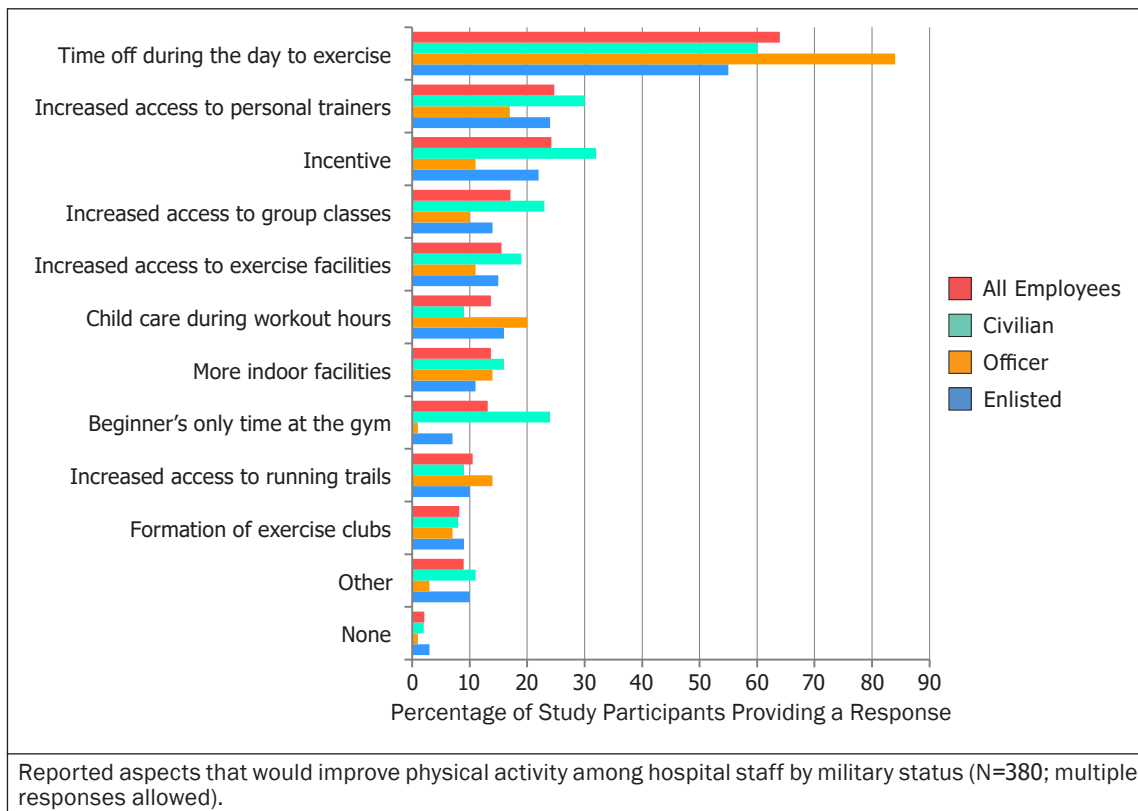
Ninety percent of respondents considered themselves to be healthy, and of those who considered themselves to be unhealthy (n=38), 95% were interested in becoming healthier. Although the survey population largely considered itself to be healthy, many respondents reported unhealthy behaviors such as not enough exercise and poor eating habits. Over half of all respondents (n=222, 58%) indicated that they did not get enough exercise and 158 participants (42%) responded that they were either somewhat or very dissatisfied with their personal physical activity and exercise. As reported by Schuh-Renner et al,¹⁴ 47% of respondents reported at least one injury in the previous 12 months. Active duty military members had greater risk for injury, and activities associated with injuries in this population were similar to those in other military populations (physical training, walking/hiking, and lifting or moving objects).

Despite a long list of possible barriers from which to choose and the freedom to select multiple barriers, as shown in Table 2, the top 3 barriers were nearly twice as prevalent among respondents as all others. Lack of time was common to 65% of participants and lack of motivation affected nearly half (45%) of participants. A previous medical condition was reported as a barrier in just over a

quarter (27%) of all participants. Those citing pain/other medical conditions, lack of experience, financial burden, and discomfort with the gym crowd as barriers to physical activity were more likely to perceive themselves as unhealthy, as 26%, 26%, 25%, and 22% of respondents citing those barriers, respectively, reported perceived lack of health. Enlisted respondents identified previous medical conditions and lack of experience as barriers to physical activity more frequently than other affiliations, while civilians were more likely to cite the financial burden and being uncomfortable with the gym crowd.

Participants also answered questions about aspects of the work environment and available health promotion activities that might improve their physical activity levels. Almost two-thirds of participants (n=243, 64%) indicated that time off during the workday to devote to exercise would improve their physical activity, an aspect nearly 3 times as important as any other as shown in the Figure. This illustrates the importance of time to employees and how closely they associate personal time with their ability to be physically active. Incentives and access to personal trainers, 2 potential factors to improve motivation, were cited as being the next 2 most important aspects that would improve physical activity.

The data suggest that barriers not only affect participation in physical activity itself, but also the organization's



outlook on physical activity. The sample population indicated that adult physical fitness was the health education topic of greatest interest. However, the follow-on questions indicated that nearly 65% of participants anticipated that lack of time would be a barrier to attending health education classes. Respondents who reported a previous medical condition, lack of experience with exercising, or financial burden as barriers to physical activity were more likely to also report a perceived lack of health (26%, 26%, and 25%, respectively), as shown in Table 2.

Given that specific perceived barriers showed correlation to lack of perceived health, the overall number of barriers an individual experienced was examined as another potential factor related to perceived lack of health. Univariate regression analysis showed higher odds ratios with increasing number of barriers indicated (Table 3). This result was statistically significant when 4 or more barriers were reported ($P \leq .01$). Selected demographic variables (age 55 or older, female gender, and civilian employee status) were also significantly or marginally associated with perceived lack of health ($P \leq .10$).

Multiple logistic regression analysis was performed with the variables that were found to be significant in univariate analyses. The presence of 4 or more barriers to physical activity was the only statistically significant factor associated with respondents' perception of health ($P = .04$), as shown in Table 4.

COMMENT

Addressing the obesity epidemic is paramount in preventing devastating disease processes and decreasing barriers to physical activity is a key component of prevention. Previous studies have found that lack of time, motivation, and knowledge are barriers to an individual's wellness,^{5,6,8-10} but there is little evidence available about barriers to physical activity among employees of a military medical facility, given the unique aspects of that population. This study confirms that the same barriers (time, motivation, and knowledge) also influence the perceived wellness of military medical facility employees. Additionally, survey participants indicated that they would change aspects of their environment that directly related to these same barriers, if possible, including

Table 2. Barriers to Physical Activity and Perceived Lack of Health (N=380, multiple responses were allowed).

Barrier to Physical Activity	All Respondents N=380 n ₁ (%N)	Enlisted n ₂ =118 (%n ₂)	Officer n ₃ =87 (%n ₃)	Civilian n ₄ =175* (%n ₄)	Respondents Reporting Lack of Health (%n ₁)
Lack of time	247 (65%)	65 (55%)	70 (80%)	112 (64%)	21 (9%)
Lack of motivation	171 (45%)	49 (42%)	24 (28%)	98 (56%)	21 (12%)
Pain or previous medical condition	104 (27%)	39 (33%)	18 (21%)	47 (27%)	27 (26%)
Not comfortable with gym crowd	58 (15%)	12 (10%)	7 (8%)	39 (22%)	13 (22%)
Lack of support network	54 (14%)	14 (12%)	9 (10%)	31 (18%)	8 (15%)
Weather	54 (14%)	16 (13%)	17 (20%)	21 (12%)	8 (15%)
No child care	46 (12%)	16 (14%)	14 (16%)	16 (9%)	4 (9%)
Financial burden	20 (5%)	1 (1%)	0 (0%)	19 (11%)	5 (25%)
Lack of experience or knowledge	19 (5%)	9 (8%)	1 (1%)	9 (5%)	5 (26%)
Work	11 (3%)	2 (2%)	6 (7%)	3 (2%)	1 (9%)
No parking at gym	0 (0%)	-	-	-	-
Other	16 (4%)	2 (2%)	4 (5%)	10 (6%)	1 (6%)
None	32 (9%)	19 (16%)	3 (3%)	10 (6%)	1 (3%)

*Total (n₄) includes 169 Department of the Army civilian employees and 6 contract employees or hospital volunteers.

finding time for exercise during the day and adding exercise facilities. Furthermore, the current analyses indicated that the barriers not only affect respondents' ability to be physically active, but employees anticipate that similar barriers would affect participation in the organization's offering of physical exercise groups and wellness education sessions.

These barriers not only affect the individual's participation in physical activity, but are also correlated with perception of one's own health. Regression analysis controlling for demographic characteristics indicated that if a person identified 4 or more barriers affecting their participation in physical activity, they were 9 times more likely to perceive themselves as unhealthy. While this result may be intuitive, the consequences are significant. Additional research examining the combinations of perceived barriers to physical activity would increase understanding of their effects on various populations.

The active duty military members in this population (54% of respondents) face unique challenges. The highly transient life of most military personnel often leads to greater distances between the Soldier and family members and traditional social support networks. Furthermore, requirements to maintain physical fitness, mandatory attendance at unit physical training activities, and additional military duties lead to unique challenges for military providers when compared to traditional patient care providers. Despite these differences, our

results indicate that barriers common to other populations (lack of time and motivation) exist in a military medical facility. Additionally, these very same barriers are statistically related to the employee's perceived health, giving more credence to the idea that barriers must be addressed in a fashion that is meaningful to the individual. Recommendations from the American Heart Association state that employers should seek to reduce or eliminate barriers that discourage use of worksite wellness programs.¹⁵ Further research should be performed to identify the most effective ways to both measure and efficiently address those barriers.

Since workplaces are now taking more prominent roles in advancing the health of their employees,¹⁶ organizational leaders must carefully consider barriers to participating in wellness activities and their impact on the overall health of employees. Large multinational corporations like Google are providing employees access to state-of-the-art fitness centers and multiple opportunities for physical activity.¹⁷ The need to eliminate these barriers is necessary not simply to enhance the employee experience, but also to financially benefit the organization. Financial incentive is gained through decreased healthcare costs, increased productivity, improved morale, increased retention, and decreased absenteeism. As Baicker and colleagues¹⁸ explain, savings are not simply associated with decreased healthcare costs; rather, additional revenue is appreciated when workers are present and well. Decreased absenteeism, for example, allows workers to focus on their own productivity, rather than making up for the work not completed by an absent colleague. Baicker et al found that the return on investment in wellness programs was \$3.27 for every dollar spent through decreased healthcare cost and \$2.73 for every dollar spent through decreased absenteeism.¹⁸

This study had some limitations. With approximately 32% of the hospital population responding to the survey, it is possible that those who responded did not represent the entire population. The people who were interested enough in wellness to complete the survey may have different barriers than those who chose not to participate. Furthermore, the dichotomized self-assessment of health may have led to a decreased ability to detect differences. Small sample sizes among some subgroups led to large confidence intervals on risk ratios and odds ratios, making it difficult

to draw statistically sound conclusions from the data. With only 10% of individuals reporting themselves to be unhealthy, there may not have been enough power to assess the correlation of all barriers with perceived health. In future studies, the use of a Likert scale may be a more efficient and powerful tool to evaluate self-assessed health metrics.

Table 3. Injury Incidence: Factors Associated with Perceived Lack of Health (N=380).

Variable	Total in Variable Category n ₁	Perceived Lack of Health n ₂ (%n ₁)	Odds Ratio (95% CI)	P Value
Number of Barriers to Physical Activity				
0	39	1 (3%)	1.00	
1	108	7 (6%)	2.53 (0.32-19.89)	.36
2	102	9 (9%)	3.44 (0.45-26.27)	.20
3	79	8 (10%)	3.95 (0.51-30.47)	.15
4 or more	52	13 (25%)	9.75 (1.33-71.40)	<.01
Age, years				
18-25	34	1 (3%)	1.00	
26-39	145	10 (7%)	2.35 (0.31-17.70)	.39
40-54	138	16 (12%)	3.94 (0.54-28.69)	.13
55 or older	63	11 (17%)	5.94 (0.80-44.04)	.04
Sex				
Female	214	27 (13%)	1.90 (0.97-3.73)	.05
Male	166	11 (6%)	1.00	
Military Affiliation				
Enlisted	118	8 (7%)	1.48 (0.46-4.74)	.51
Officer	87	4 (5%)	1.00	
DOA* civilian	169	25 (15%)	3.22 (1.16-8.95)	.01
Other†	6	1 (17%)	5.44 (0.77-38.16)	.08
Education				
High school or GED	86	9 (10%)	1.30 (0.53-3.24)	.57
Associate's	80	9 (11%)	1.43 (0.58-14.53)	.43
Bachelor's	83	9 (11%)	1.38 (0.56-3.43)	.48
Master's or Doctorate	102	8 (8%)	1.00	
Other professional degree	29	3 (10%)	1.32 (0.37-4.66)	.67
Occupation				
Nurse	61	6 (10%)	0.98 (0.35-2.77)	.98
Physician	23	0	0	.12
Medic	50	3 (6%)	0.60 (0.16-2.21)	.44
Technician	38	5 (13%)	1.32 (0.45-3.87)	.62
Pharmacy	8	1 (13%)	1.25 (0.18-8.90)	.83
Other medical profession‡	77	6 (8%)	0.78 (0.28-2.21)	.64
Administration	53	10 (19%)	1.89 (0.77-4.63)	.16
Other nonmedical or unspecified	70	7 (10%)	1.00	

*DOA indicates Department of the Army.

†Contract employees and volunteers (retired military).

‡This category includes clinical providers who could not be grouped into broad categories (eg, behavioral health professionals, physical therapists, and dentists).

Table 4. Multivariable Logistic Regression Results: Factors Associated with Perceived Lack of Health (N=380).

Variable	Total in Variable Category n ₁	Perceived Lack of Health n ₂ (%n ₁)	Risk Ratio (95% CI)	P Value
Number of Barriers to Physical Activity				
0	39	1 (3%)	1.00	
1	108	7 (6%)	2.05 (0.24-17.66)	.51
2	102	9 (9%)	3.06 (0.37-25.88)	.30
3	79	8 (10%)	3.51 (0.42-25.88)	.25
4 or more	52	13 (25%)	9.46 (1.14-78.66)	.04
Age, years				
18-25	34	1 (3%)	1.00	
26-39	145	10 (7%)	2.76 (0.32-24.02)	.36
40-54	138	16 (12%)	4.45 (0.49-40.80)	.19
55 or older	63	11 (17%)	6.79 (0.66-70.06)	.11
Sex				
Female	214	27 (13%)	1.34 (0.55-3.27)	.53
Male	166	11 (6%)	1.00	
Military Affiliation				
Enlisted	118	8 (7%)	2.21 (0.59-8.28)	.24
Officer	87	4 (5%)	1.00	
DOA* civilian	169	25 (15%)	2.08 (0.62-6.94)	.23
Other†	6	1 (17%)	3.45 (0.25-46.66)	.35

*DOA indicates Department of the Army.
†Contract employees and volunteers (retired military).

Approaches to improving barriers to physical activity, including environmental changes, are necessary to facilitate an environment of disease, injury, and obesity prevention. Institutional leaders should continue to explore programs that investigate and address common barriers to physical activity. Leaders in military hospitals should consider programs that promote the principles of the Department of Defense initiative Operation Live Well, a program that intends “to make healthy living the easier choice and social norm...”¹⁹ Policies that address barriers of time and motivation, such as authorizing employees 3 paid hours per week to participate in a fitness program, are particularly beneficial and have been successful in other military workplaces.²⁰ Agreements between leadership and employees facilitate participation in exercise activities, but also require consistent documentation of the workouts, approved routines, and health clearances to continue participation. A cultural change that embraces physical activity and encourages it as a part of each day would be a useful step toward preventing chronic disease processes among military healthcare employees. The analysis and reporting of the successes and failures of these programs will pay dividends financially, emotionally, and physically for many in our communities.

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