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The FAA Health Awareness Program: Results of the 1998 Customer Service Assessment Survey

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16. Abstract

This report presents the results of an agency-wide survey of employee health and wellness to determine workforce involvement in and satisfaction with the Federal Aviation Administration's Health Awareness Program (HAP). Surveys were received from 3,262 employees, representing a 45% response rate. Results indicated that about half the workforce had heard about HAP and that about half the workforce had participated in one or more HAP events (even if they did not realize that the event was HAP-sponsored). In terms of attendance, the most popular HAP information programs were health fairs, health awareness lectures, and stress management awareness programs. Likewise, annual flu shots, cholesterol screening, blood chemistry screening, and blood pressure screening were the most popular HAP service programs. Analyses found a consistent relationship between HAP participation and employee exercise rates, involvement in healthy lifestyle behaviors, and overall wellness. These findings may have been influenced to some extent by respondent characteristics, which were somewhat disproportionately over age 45, female, and managerial. However, the respondents' backgrounds matched previous study results, indicating that Federal Aviation Administration respondents accurately represent the HAP customer base -- that segment of the workforce most interested in health and wellness.

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The FAA Health Awareness Program: Results of the 1998 Customer Service Assessment Survey

INTRODUCTION

By the middle 1980s, a large number of work organizations had instituted employee health awareness programs (HAPs; (Caldwell, 1995; Office of Disease Prevention and Health Promotion, 1993). The goal of these programs was to promote wellness activities and lifestyle changes that might help to reduce the frequency and severity of illness. Additional goals included reducing work-related stress and improving employees' general quality of life and sense of well-being. Beginning in the early 1990s, articles began to appear with increasing frequency that called for studies to determine what impact the HAPs were having on workplace wellness (e.g., Pirie, Stone, Assaf, Flora, & Maschewsky; Schneider, 1994; Schaeffer, Snelling, Stevenson, & Karch, 1994). This report presents the results of an assessment of the Federal Aviation Administration's Health Awareness Program (FAA-HAP).

The number of organizations that offer HAPs to their employees continues to increase each year. Not surprisingly, authors have noted a coincident rise in HAP popularity with an escalating trend in health care costs to employers (Chenoweth, 1994; Data Watch, 1991; Witmer, 1995). Although containing the growth of employer-sponsored health benefits costs is a key focus for management, there are other economic benefits that work organizations can derive from HAPs. Shephard (1994) showed that HAP programs can reduce lost time from work by preventing or ameliorating the effects of illness and injury. Edwards, Tindale, Heath, and Posavac (1990) as well as James and Colwell (1997) indicate that HAPs can enhance job performance by increasing participant self-efficacy and sense of energy and well being. Baun (1994) reported an association between reduced absenteeism and HAP participation. Justifications other than direct economic benefits have been noted for supporting employee HAPs. These include enhanced corporate image (Pencak, 1991), and the ability to attract high- quality job applicants (Baun, Bernacki, & Tsai, 1986).

Overview of FAA-HAP

FAA-HAP was inaugurated on October 1, 1988, with a one-year prototype project based at the FAA Washington, DC headquarters health clinic. In 1990, the program was expanded to include all nine of FAA's geographical regions and its two major centers (Mike Monroney Aeronautical Center and the William J. Hughes Technical Center). Although many HAPs now offer a limited variety of programs FAA-HAP offers a broad range of health awareness information programs and services. To demonstrate the scope of these offerings, we categorized its programs according to taxonomy developed by Pencak in 1991 to indicate how comprehensive a HAP may be. According to Pencak, HAPs that offer a variety of programs in each of three levels of lifestyle intrusiveness are the most comprehensive. Level I programs offer events to raise health awareness through health fairs, posters, newsletters, education classes, and health screening without follow-up. Level II programs offer events that help employees to change lifestyle behaviors such as reducing tobacco use and alcohol consumption, exercising regularly, and by offering programs to help modify behaviors. Level III programs work with management to institute policies and practices that promote and sustain a healthy lifestyle as a business practice. Table 1 presents a breakdown of FAA-HAP program offerings for each of Pencak's three levels. As Table 1 shows, FAA-HAP offers a balanced program that spans all three levels.

To ensure a comprehensive program, a national team of occupational health nurses develops and submits an annual FAA-HAP activity plan to the Federal Air Surgeon. Medical supervision and support of these FAA-HAP activities are provided by the flight surgeons at FAA's 12 regional units, which include its national and nine regional headquarters, as well as the Mike Monroney Aeronautical Center and the William J. Hughes Technical Center. FAA-HAP activities may differ slightly from location to location in the timing and manner of presentation, but they conform to the national plan. FAA-HAP's objective is to ensure that all agency employees have

the opportunity to receive health-related information and to participate in health screening services and activities throughout the work year. Therefore, the two primary goals of this study were to estimate HAP participation levels within the FAA workforce and to identify common barriers to broad program participation.

Evaluating Health Awareness and Workplace Wellness

As HAP program budgets become a larger part of an organization's budget, it is reasonable to expect challenges to the continuation of HAPs. Therefore, regular program evaluations become a vital factor in justifying HAP continuation and/or expansion. The evaluation of HAPs is challenging. The American Evaluation Association (AEA) devoted an entire issue of its journal, *New Directions for Program Evaluation* (Braverman, 1989) to the topic. AEA articles identified many barriers to successfully evaluating HAPs, and offered ideas about how to deal with them.

One of the most troublesome challenges to HAP evaluation identified by AEA and others (Schaeffer et al., 1994) is the unreliability of job-related outcome measures. Many organizations do not consistently or systematically report such job behaviors as performance levels, absence from work, absence due to illness/injury, etc. A second challenge stems from the fact that HAPs are not the only source of wellness intervention to which employees are exposed (Pirie et al., 1994). Therefore, within-organization evaluations may quantify changes that are difficult to attribute directly to HAP interventions. A third challenge, related to the second one, is that stress, illness, and injury also can be caused by or influenced by factors outside the workplace, thereby making it difficult to control for effects unlikely to be influenced by HAP interventions. A fourth challenge is how to make credible conversions of valid job-related HAP outcomes into dollar amounts (Lynch, 1994; Raju, Burke, & Normand, 1990; Schmidt, Hunter, & Pearlman, 1982). Finally, a fifth challenge stems from the typically long time lags associated with healthful lifestyle interventions and HAP participant health outcomes such as reduced heart disease, diabetes, or stroke (Blair, 1995).

This study inaugurates the evaluation of FAA-HAP. All of the evaluation challenges reviewed here apply to the FAA. Therefore, it was necessary to design an assessment strategy that would immediately provide information useful to program sponsors that also might enable more definitive evaluation in the future. Reviews of the effects of wellness programs by authors like Pelletier (1991, 1993, 1996) demonstrate wide variability in evaluation designs. Still, Pelletier shows that most-common is the within-organization pre-post design that compares aggregated summaries of employee health outcomes at two or more points in time, assigns a cost to the employer in terms of lost time from work, insurance costs, etc.; and then associates health changes with HAP participation. The current study will enable follow-up research using such a pre-post design (e.g., Cook & Campbell, 1979; page 99). However, this study was not intended to establish a direct cost-benefit link between FAA-HAP and the agency's budget.

The goals of the present study, in order of priority, were to:

1. assess the level of employee participation in FAA-HAP,
2. identify barriers to participation in FAA-HAP,
3. discover possible ways to enhance participation in FAA-HAP,
4. create an aggregate baseline estimate of employee fitness and wellness for future evaluation,
5. produce data to enable linking fitness, wellness, and lifestyle changes to FAA-HAP participation.

Because all data were collected via questionnaire, detection of significant participation effects was not expected to emerge from self-reported exercise, wellness, and lifestyle change activity. They were included with the expectation that future surveys would enable trend analyses to examine for HAP effects on health-related activities and outcomes for the FAA workforce.

METHOD

Participants

A 15% random sample (7,309) of the FAA's workforce of more than 48,000 was selected to receive questionnaires at their offices. Because corporate HAP programs are a service to employees, the FAA-HAP evaluation survey was presented as a customer service questionnaire. Studies of customer service often indicate very low response rates to customer surveys. Therefore, an effort was made to obtain endorsements from the seven unions that

represented most FAA employees. Union officials co-signed the cover letter requesting participation, and each union's logo was prominently displayed under the FAA letterhead. Completed surveys were received from 3,262 employees, yielding a 45% response rate. Table 2 summarizes the demographic breakdown of respondents, compared to the FAA population.

Table 2 shows that survey respondents differed significantly from the FAA population as a whole. Respondents were disproportionally older (over 45), female, and in management positions. Likewise, among the 12 regional units sampled; four did not match population parameters. Central and Northwest Mountain regions were over-represented by 25% and 21% respectively, whereas the William J. Hughes Technical Center and Washington HQ were under-represented by 40% and 18%, respectively.

Analyses were conducted to test the hypothesis that survey participation might have been influenced by HAP participation. Past studies have shown that women, older people, and people of relatively high occupational status are generally more health conscious than males younger people, and people without college degrees; and therefore, are more likely to participate in health awareness activities (e.g., Furnham & Kirkcaldy, 1997; Heckler, 1985; Nakazono, Davidson, & Anderson, 1997). Correlations were run on all four background factors with self-reported participation in FAA-HAP. A small but significant relationship was found between each factor and reports of participation in FAA-HAP. The relationship between age and FAA-HAP participation was low but significant[1] ($\gamma = .15$, $p < .001$) with HAP participants being older. The correlation between gender and HAP participation was $\varphi = .11$, $p < .001$[2], with female respondents being somewhat more likely to participate in HAP. The correlation between manager status and FAA-HAP participation was $\varphi = .15$, $p < .001$, with managers being more likely than nonmanagers to participate. Finally, there was a significant relationship between region and participation rates ($p = .24$, $p < .001$).[2] This latter relationship may reflect the fact that FAA-HAP programs are administered regionally, and can vary in quality and accessibility by region. Therefore, results support a conclusion that differences in survey participant background might be due to greater response rates from HAP participants.

The Survey

The FAA-HAP Customer Service Survey is a 36-item checklist-type questionnaire with an additional five items addressing personal background (e.g., sex, age; see Appendix A). Because delivery of FAA-HAP program and service is not designed or marketed using the Pencak (1991) three-level taxonomy used to demonstrate program breadth and depth, a different taxonomy was used for organizing this report. FAA-HAP divides programs into two groups: information programs and service programs. Information programs increase participant awareness of healthful behaviors or educate participants about how to change their lifestyles to include behaviors that promote good health. Service programs provide immunizations against common illnesses such as flu, and screen for biological evidence of common diseases.

Survey items asked respondents to indicate their past participation in any of 13 information programs and 12 services programs. Participation items were followed by requests to identify barriers to participation in each of the two types of programs. Respondents were also asked to indicate how they first learned about FAA-HAP, about the specific program that was their first HAP experience, and what type of promotion activities most appeals to them. Respondents also completed a healthstyle activity matrix (see Appendix A, page A1) on which they reported the duration of involvement in any of eight exercise/fitness regimes and five lifestyle changes. The matrix included a space to indicate whether participation in each exercise form or lifestyle change was still actively being pursued. The survey ended with a brief self-assessment of well being during the previous 12 months followed by a few questions about the respondents' characteristics and background. Assurances of anonymity were made in this final section.

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[1] Gamma (γ) is a measure of association similar to a correlation coefficient. It is used when examining relationships among categorical and ordinal variables (Mueller, Schuessler, & Costner, 1970).

[2] Phi (φ) is a measure of association between two categorical variables. In the two by two contingency table, φ is identical to the Pearson correlation coefficient (r) (Hays, 1973).

RESULTS

HAP Participation

Forty-two percent (1,274) of the respondents indicated that they had previously heard about FAA-HAP. Additionally, another 15% (473) of respondents, who reported no previous knowledge about HAP, indicated participation in at least one HAP program. Therefore, 57% of respondents had either heard about HAP and/or had participated in an FAA-HAP program.

Respondents were asked to indicate how they first learned about FAA-HAP and in which program they first participated. Results presented in column 1 of Table 3 show respondents were most likely to hear first about HAP from a local FAA medical representative (20.3%). Flyers announcing health screening, newsletters, and the Center for Management Development (CMD) were the second-most common way in which respondents first learned about HAP. All three were relatively equal at about 14% each. Results in column 2 summarize the HAP programs in which respondents first participated. The annual flu shot program and health fairs were the most commonly identified events in which employees first encountered FAA-HAP, each accounting for over 20% of reported first encounters. These programs were followed by blood chemistry screening (12.7%) and cholesterol screening (9.8%).

Overall, 49.2% (1,605) of respondents indicated participating in at least one HAP program, while over half of the participants (58%; or 27% overall) had attended two or more programs. Overall, 33% of respondents overall reported participating in one or more information programs, with 42.7% overall reporting participation in one or more service programs.

Table 4 summarizes program participation for the various information and service programs. Data summarize the percentage of total respondents and of respondents who participated in one or more information program(s)/service program(s). Consistent with the first contact with HAP results listed in Table 3, health fairs were the most popular information program and the flu shot program was the most popular service program. In relative order of popularity, health fairs, health awareness lectures, stress management awareness, and fitness awareness were the top four information programs in which respondents participated. These programs represented 71% of all 2,282 HAP participants responding to information items. The annual flu shot program, cholesterol screening, blood chemistry screening, and blood pressure screening were the top four service programs in which respondents participated, which represented 70% of all 3,860 participants responding to service items.

Program Participation Influence on Subsequent HAP Participation

If HAP participation actually achieves its goal of increasing health awareness, then one logical outcome of participation in a HAP wellness program should be an increased likelihood that employees would participate in other wellness programs. Figure 1 presents a simple recursive model depicting the hypothesized likelihood that HAP participation leads to increased participation in other types of HAP wellness programs.

A test of the model was limited to four programs with high levels of participation to ensure sufficient variance to meet assumptions for analyses using dichotomous data. In addition, the model was limited to examining participation across the two types of wellness program (i.e., information and services) to help control for temporal coincidence. For example, it was necessary to control for the possibility that blood pressure testing (a service) might be made available coincident with cholesterol screening or blood chemistry testing (other types of services).

Because of the recursive nature of the participation model, the direction of causality is not relevant. The magnitude of the relationship is of primary concern. Therefore, various analytic approaches for testing the model in Figure 1 were considered. The use of simultaneous structural equations was not selected because, even for a simple recursive model, the number of coefficients generated would be numerous and the presentation of results would be complex. Also, general unfamiliarity with interpretation of goodness of fit indicators might be confusing. Had the model been nonrecursive, implying temporal causality, then structural equations would have been preferred regardless of the complexity of results. Two other methods were considered, logistic regression and multiple discriminant analysis (MDA). Both methods were applied to test the model, and both yielded almost identical results. Presented here are the MDA results, because the statistical coefficients from MDA should be familiar to most readers.

MDAs were conducted to analyze the participation levels of HAP participants and nonparticipants in the two most popular information programs (health fairs and health awareness lectures) and the two most popular service programs (flu shots and cholesterol screening) on attendance levels for all the other types of information or service programs. MDA is equivalent to a single-factor multivariate analysis of variance in which participation/nonparticipation in a particular service or information program is made the dependent variable (Kerlinger & Pedhazur, 1973; Stevens, 1986). The independent variables comprise participation levels in all of the programs not in the same type as the dependent variable. For example, independent variables might be all service programs vis-a-vis the dependent variable: participation in an information program like health fairs.

MDA produces a multivariate *F*-test of the *chi-square* (χ^2) for between-group differences on all independent variables analyzed. An indication of strength of relationship between participant/nonparticipant status and participation in the other types of programs is provided by the canonical correlation coefficient, R_c. A significant R_c permits direct interpretation of univariate (1-Way) *F*-tests comparing the group averages for each independent variable, without concern for Type I error caused by repeated testing. MDA also yields weights that order, the independent variables, relative to their contribution to between-group differences. The larger the function weight, the larger the difference between participants and nonparticipants in the dependent variable group (Harris, 1975; McKay & Campbell, 1982).

Tables 5 and 6 summarize the results of the MDAs. All equations were significant in the multivariate sense (considering all variables together). For ease of interpretation, only six programs with the greatest between group differences were listed. Between-group average differences were found to be significant for all six program variables. The four equations of Tables 5 and 6 accounted for between 10 and 25% of variance in program participation, based upon the square of the canonical correlations.

Tabled in columns are the associated function weights for each variable in the equation, converted to correlation coefficients (i.e., structure loadings); the averages for the two groups (participants and nonparticipants); and the univariate (1-Way) significance levels for between-group differences. Note that the averages are in decimal form because responses were dichotomous due to the checklist nature of the items.[3]

Table 5 shows that, compared to respondents who did not attend health fairs, health fair attendees were relatively more likely to participate in blood pressure screening, followed successively by cholesterol screening, blood chemistry screening, health risk assessment, body fat measurements, and annual flu shots. Employees who reported attending health awareness lectures were more likely to participate in cholesterol screening, blood pressure screening, health risk assessment, body fat measurement, blood chemistry screening, and blood sugar/diabetes screening. Similarly, the results of Table 6 show that respondents who had flu shots and/or cholesterol screening were also more likely to have participated in a number of information programs. The pattern of information program participation levels were almost the same, showing that respondents who participated in either of the two service programs were more likely to attend health fairs, health awareness lectures, and stress management awareness programs in addition to fitness awareness, weight management, and the personal viewing of medical information videos.

Barriers and Enticements to HAP Participation

Results reported so far indicate that about half of FAA respondents indicated participation in HAP. Also, once an employee participates in one HAP event, it was shown that they are more likely to participate in other types of HAP events. These results lead to a conclusion that getting employees to participate in HAP initially can be an important method for increasing the workforce participation level. Knowing what employees consider to be barriers to their participation should offer clues regarding how to increase employee involvement in FAA-HAP. Respondents were asked: "Regardless of whether or not you have participated, please indicate your BIGGEST BARRIER to participation…" for each of the two types of programs. The list of 15 barriers was based primarily upon 13 factors identified in published research (Shephard, 1983, 1994; Wilson, 1990 and several explanations volunteered to occupational health professionals within the FAA.

[3] Because all items were coded 0 and 1 (selected or not selected), averages must fall between 0 and 1. Dichotomization normally reduces variance, thereby masking true relationships and differences. This is discussed at length in Nunnally (1978).

Table 7 summarizes the barriers identified by respondents. The percentages for each type of HAP program are very similar. In fact, the cross-tabular contingency coefficient was high, $r = .93$, indicating a high degree of consistency in how respondents reported barriers to HAP participation across the two program types. From these results, one can conclude that the barriers to participation are unlikely to be influenced by the type of HAP program (information or service). Approximately one quarter of respondents reported no barriers to participation in the FAA-HAP. Thus, nearly 75% of respondents reported a barrier. Over 40% of respondents reported never or rarely hearing about HAP programs. The next largest barrier, program never or rarely available in the respondent's local area, was mentioned by almost 10% of respondents. Excluding the "no barrier" respondents, never/rarely hearing or never/rarely available, account for over 70% of reported barriers.

In addition to barriers to participation, the survey also asked respondents which health/wellness promotion activities "most" appealed to them. Seven options were provided. Table 8 summarizes the promotional activities endorsed by respondents.

As Table 8 shows, health screening and high involvement activities (e.g., exercising and dieting) were most appealing to the 2,457 employees who responded to the item. Among those who selected the "other" category, 20% (18) mentioned creating a fitness room/exercise center at work or subsidizing membership in a nearby health club. The remaining options were rarely mentioned by more than one respondent.

Baseline Wellness Activities

An additional goal of the HAP survey was to establish a national baseline for employee wellness activities against which to gauge changes in the future. Respondents were asked, regardless of HAP participation, to indicate their involvement in eight exercise programs and five lifestyle changes advocated by FAA-HAP. Employees were asked:

> Please indicate which wellness activities you have begun during the past 24 months, regardless of HAP's influence. In addition, please estimate how long you have been able to stay with the activity, and whether you are still doing the activity. [Mark all that apply]

The duration options ranged from a few days to 19 to 24 months.

Baseline Exercise Program Participation

Two tables summarize the exercise data. Table 9A presents participation levels for all respondents in the FAA. Table 9B presents participation levels limited to those reporting participation in some type of exercise. Table 9A results enable identifying the most popular types of exercise among agency employees based upon self-reported participation levels. Table 9B results enable identifying types of exercise that attract the greatest amount of employee participation.

Table 9A lists each type of exercise down the first column. Subsequent columns, moving left to right, indicate the total number and percentage of all respondents participating in each type of exercise. For example, 1,460 respondents indicated participation in walking, which was 44.8% of 3,262 respondents. Respondents were free to indicate participation in more than one type of exercise. Participation was followed by the percentage of respondents in each of seven duration categories expressed as a percentage of the total sample (N = 3,262). For example, 6.1% of all respondents indicated that the duration of their walking extended only a few days, whereas 18.5% indicated 19 to 24 months' participation. The final three columns indicate the number and percentage of the total sample continuing each program of exercise, and the percentage who reported continuing in each program of exercise for more than 18 months. For example, 1,144 respondents reported that they are continuing to walk, which is 35% of the total sample, thereby indicating that 316 respondents had stopped walking. The last column shows that 17% of the total sample reported walking for over 18 months, and that they are continuing to walk for exercise. Finally, the last row summarizes reports of participation in one or more type of exercise.

Following the format of Table 9A, Table 9B limits results to those reporting participation in some type of exercise. These results enable generalization to the population of exercising employees. One notable difference from Table 9A is that the relative percentage column sums to 100% of all 4,498 instances of self-reported exercise. This column of data enables relative comparisons of the popularity of each type of exercise among exercising employees. As Table 9A shows, almost 70% of respondents reported engaging in some form of exercise during the past 24 months.

Compared to other exercise types, a higher percentage of those involved in walking, a mixture of fitness activities, or gym/fitness center workouts were continuing after 18 months. In fact, the average canonical correlation between exercise level and continuation was $R_c = .76$ ($\chi^2 = 1405.8$; $p<.0001$). The relative popularity of programs is demonstrated on both Tables 9A and 9B, with the greatest percentage of all respondents engaged in walking (44.8%) and the fewest engaging in skating (3.7%). Among exercisers, 32.5% walk, whereas only 2.7% skate. The columnar data of Table 9A cannot present a clear picture of relative dropout trends because they include respondents who did not report any exercise (31%). Dropout trends can help to identify programs capable of generating high initial interest, yet fail to sustain that interest. Programs with substantial dropout trends may need revision, or reduced resources may be justified in cases where HAP influence may be limited. Dropout trends can best be inferred from the data presented in Table 9B.

Looking at the relative percentage of exercisers who stay with a program for at least 18 months, it can be seen in Table 9B that swimming and skating had the lowest adherence levels. Moreover, inspection across the matrix for swimming and skating shows that a relatively large percentage of respondents participated for only a few days or weeks. This pattern suggests that respondents found it difficult to adhere to a regular pattern of exercise for these two exercise types, with most dropping out within 18 months. It is interesting to note that a somewhat reverse pattern is shown for the three programs with the highest continuation levels (walking, mix of activities, and gym/fitness center). The initial participation levels for the three are relatively small but show substantial levels of adherence beyond 18 months. Moreover, although walking was relatively the most popular exercise program in terms of the numbers of participants, participation levels beyond 18 months were about average. Three forms of exercise were higher than walking at 19 to 24 months (a mix of activities, gym/fitness center workouts, and jogging) and four forms were higher among those continuing after 18 months. Therefore, while the popularity of different exercises may vary, adherence to regular exercise over time (measured in terms of either participation or continuation after 18 months) is similar for six of the eight exercise types studied.

The results of Tables 9A and 9B do not shed light on whether or not exercise levels are related to FAA-HAP participation. To determine if there is a relationship between HAP participation and exercise, exercise levels for FAA-HAP participants and nonparticipants were compared using MDA. Data were coded on a seven-point ordinal scale ranging from 0 (no participation) to 7 (19 to 24 months' duration) consistent with the categories in Tables 9A and 9B. Because most people who exercise are limited by time to only a few forms, the data set will necessarily contain many zero values, even among exercisers. This situation does not affect the validity of between-group tests, but it does constrain the range of values and associated group averages. Two analyses were conducted. The first MDA equation examined participation levels, and the second examined continuation levels. Table 10 presents the overall results for the MDAs in terms of the size of the canonical correlations and multivariate significance of the chi-squares. Tabled in columns are the associated function weights for each variable in the equation, converted to correlation coefficients (sometimes called structure loadings), the averages for the two groups (participants and nonparticipants), and the univariate significance levels for between-group differences. Only univariate significant differences should be interpreted and only when the overall MDA achieves multivariate significance McKay & Campbell (1982).

As Table 10 shows, there was a multivariate significant difference between FAA-HAP participants and nonparticipants with FAA-HAP participants exercising significantly more than nonparticipants. Inspection of each univariate analysis of variance shows statistically significant differences between FAA-HAP participants and nonparticipants for average walking and jogging levels. The remaining differences were not statistically different from one another. However, exercise levels were greater for FAA-HAP participants (16% greater on average) with the exception of a mix of fitness activities. Although the amount of variance accounted for in the exercise equation is small this is partly due to the restriction of range among independent variables. In addition, 31% of respondents (regardless of FAA-HAP participation) reported no participation in exercise during the past two years. Results of the second equation show that FAA-HAP participation did not significantly increase the likelihood of continuation in exercise. However, the averages were in a direction consistent with results for exercise participation.

Baseline Lifestyle Changes

Two tables summarize the lifestyle change data. Table 11A presents participation levels for all respondents in the FAA. Table 11B presents participation levels limited to lifestyle changers. Table 11A results enable identifying the most popular types of lifestyle change among respondents upon self-reported participation levels. Table 11B results enable identifying types of lifestyle change that attract the greatest amount of employee participation. Table 11A lists each type of lifestyle change down the first column. Subsequent columns, moving left to right, indicate the total number and percentage of all respondents participating in each type of lifestyle change. For example, 1,208 respondents indicated participation in dieting to improve nutrition, which was 37% of 3,262 respondents. Respondents were free to indicate participation in more than one type of lifestyle change. Participation was followed by the percentage of respondents in each of seven duration categories expressed as a percentage of the total sample (N = 3,262). For example, 2.4% of all respondents indicated that the duration of their diet for nutrition participation extended only a few days, whereas 16.9% indicated 19 to 24 months' participation. The final three columns indicate the number and percentage of the total sample continuing each program of lifestyle change and the percentage who reported continuing in each program of lifestyle change for more than 18 months. For example, 993 respondents reported that they are continuing to diet, which is 30.4% of the total sample, thereby indicating that 215 respondents had stopped dieting for nutrition. The last column shows that 15.7% of the total sample reported dieting for nutrition for over 18 months, and that they are continuing to do so. Finally, the last row summarizes reports of participation in one or more type of lifestyle change.

Following the format of Table 11A, Table 11B limits results to those reporting participation in some type of lifestyle change. These results enable generalization to the population of lifestyle changing employees. One notable difference from Table 11A is that the relative percentage column sums to 100% of all 3,643 instances of self-reported lifestyle change. This column of data enables relative comparisons of the popularity of each type of lifestyle change among employees who made changes.

As Table 11A shows, over half (58.8%) of the respondents reported engaging in one or more forms of lifestyle change during the past 24 months. Consistent with the exercise results, Table 11A also shows a pattern that, the longer respondents stayed with a lifestyle change, the greater the likelihood that they are still adhering to that lifestyle change after 18 months. The average canonical correlation between lifestyle change level and continuation was $R_c = .78$ ($\chi^2 = 2353.3$; $p<.0001$). The relative popularity of programs is also demonstrated in Table 11A, with the greatest percentage of all respondents changing their diet to improve nutrition (37%), and weight loss/diet (28.9%), and the fewest trying to reduce smoking (12.3%). The columnar data of Table 11A cannot present a clear picture of relative dropout trends because they include respondents who did not report any lifestyle changes (41%). Dropout trends can help to identify programs capable of generating high initial interest, yet fail to sustain that interest. Programs with substantial dropout trends may need revision, or reduced resources may be justified in cases where HAP influence may be limited. Dropout trends can best be inferred from the data presented in Table 11B.

Unlike the exercise results, the pattern of results for lifestyle changes is more complex. Table 11B shows that smokers were most likely to try changing for only a few days (11.4%). However, smokers were third-most likely to maintain reduced smoking after 18 months. Weight loss/diet, on the other hand, also had high participation levels for categories under six months but, relatively speaking, had the lowest adherence of all types of lifestyle change after 18 months. Moreover, participation levels across categories suggest that drop-out levels beyond six months were relatively greater at nearly all stages for weight loss/dieters when compared to other lifestyle changes.

The most popular lifestyle change begun by respondents was diet to improve nutrition, with 37% of all respondents reporting some degree of participation, and 33% of lifestyle changers indicating attempts to improve nutrition. However, continuance in nutrition programs after 18 months, while highest for all respondents (15.7%; Table 11A) was third-lowest among changers (38.7%; Table 11B). Stress reduction, on the other hand, was third-most popular among respondents and changers but it had the second-highest adherence level among all respondents at 18

months (20.2%; Table 11A) and the highest adherence level among changers at 18 months (46.1%; Table 11B).

The results of Tables 11A and 11B do not shed light on whether or not lifestyle change levels are related to FAA-HAP participation. To determine if there is a relationship between HAP participation and lifestyle change, lifestyle change levels for FAA-HAP participants and nonparticipants were compared using MDA. The first equation examined participation levels, and the second examined continuation levels. The data presented in Table 12 indicate that there was a multivariate significant tendency for HAP participants to participate and continue in lifestyle change relative to nonparticipants. The function weights order the lifestyle change programs according to the amount of difference between FAA-HAP participants and nonparticipants. Univariate significance levels indicate significant differences between FAA-HAP participants and nonparticipants. HAP participant average scores were higher for improved nutrition, stress reduction, and weight loss, respectively. Differences in continuation levels were significant for improved nutrition, stress reduction, and reduced alcohol intake, respectively. The amount of variance accounted for in the equations is small. However, this is to be expected when analyzing independent variables with restriction of range because of the checklist style of the items and because 41% of respondents reported no attempts at lifestyle change during the past two years.

Baseline Health Status

The survey also baselined self-reported health status. These data provide a baseline for future studies while providing some immediately useful information about possible wellness outcomes related to HAP participation. Nine questions addressed health changes in the past 12 months. Table 13 summarizes the percentage of respondents who indicated positive health changes. As can be seen, at least 30% of respondents indicated improvement in general well being, either through weight loss, being less ill, reducing medication usage and/or dosage, or becoming more muscular.

Three questions addressed physical examinations and their results. Employees were asked if they had undergone a thorough physical examination in the past 18 months. Also, they were asked if they had discovered a previously unknown medical condition as a result of participating in HAP information or screening service programs. Almost 70% (68.5) of respondents indicated that they had undergone a thorough physical in the past 18 months. However, that percentage dropped to 61% after eliminating respondents who indicated that a routine physical was an FAA job requirement. A small percentage of the respondent sample, 1.5% (51 respondents) reported that participation in FAA-HAP information programs led to discovery of a previously unknown medical condition. A slightly higher percentage, 3.4% (110 respondents) indicated discovery of a previously unknown condition because they participated in screening service programs.

Table 14 presents a summary of results of an MDA examining responses from FAA-HAP participants and nonparticipants. Scores ranged from a low of 0 to a high of 1. Because of missing data, only 2,244 respondents could be analyzed. Of these 50.3% were FAA-HAP participants and 49.7% were nonparticipants.

As Table 14 shows, FAA-HAP participants were significantly more likely to have reported a positive change in health status during the past 12 months. The three areas in which HAP participants reported the most improvement was less illness, reduced stress, and reduced use of prescription medication, respectively. Only aerobic fitness and weight loss were not significantly different between the two groups. As with previously reported survey results, the magnitude of between-group variance explained is small. This is likely due to the dichotomous nature of the data.

Respondents were also asked if they would be willing to participate in a health monitoring program over a number of months to help them develop a healthier lifestyle. As the pie chart in Figure 2 shows, 36.6% of respondents expressed "great" or "very great" interest in participating, while another 30.5% indicated "some" interest in monitoring.

Background Differences

Results showed significant differences between respondents and the target population. Therefore, analyses were run to determine the extent to which background affected HAP participation and reported wellness behaviors and outcomes. There is a considerable literature reporting differences in wellness behaviors due to age, gender, and even occupational factors (Anspaugh, Hunter, & Savage, 1996; Crump, Earp, Kozma, & Hertz-Picciotto, 1996; Donaldson & Blanchard, 1995; Powell, 1998). These studies

have shown that each of these three background factors significantly affect HAP participation and various wellness behaviors. Therefore, MDAs were run on FAA-HAP information program participation, service program participation, exercise levels and continuation levels, lifestyle change levels and continuation levels, and self-reported wellness. Generally, small but significant effects were found for age, gender, and managerial status. For the sake of brevity, only multivariate significance levels will be reported for the five MDA equations for each background factor. Variable-by-variable between-group averages will only be summarized in narrative. Only significant results will be reported.

Age. Older respondents (over age 45) were significantly different from younger respondents on all topic areas. Table 15 summarizes results for each topic area analyzed. As can be seen, canonical correlation coefficients were all significant, although accounting for only between one and four percent of multivariate between-group variance. Examining univariate analyses of variance, it was found that older respondents were more likely than younger respondents to participate in health fairs, health awareness lectures, medical information videos, walking for health, and stress management; but less likely to participate in cancer awareness programs.[4] Older respondents were also more likely than younger respondents to participate in all health services, except body fat, sickle cell screening, colorectal screening, and mammograms. Exercise showed that older respondents scored lower than younger respondents on all exercises except walking and swimming. The same pattern was found for continuation in exercise programs. Lifestyle changes presented mixed results. Older respondents were more likely than younger respondents to score high on diet changes (losing weight and improving nutrition) and reduced smoking, but they were less likely than younger respondents to reduce alcohol consumption. A similar pattern was found for continuation in lifestyle changes except that there was no difference in continuation levels for dieting for nutrition. Finally, older respondents reported lower levels of wellness than younger respondents in only three areas: feeling more energetic, being more muscular, and being more aerobically fit.

Gender. Female respondents were significantly different from male respondents on all topic areas analyzed. Table 16 summarizes results for each topic. Gender specific items (e.g., mammograms) were not included. As can be seen, canonical correlation coefficients were all significant, although accounting for only between one and four percent of between-group variance. Examining univariate analyses of variance, it was found that female respondents were more likely than male respondents to participate in all information programs except stop-smoking, and alcohol awareness. Similarly, female respondents were more likely than male respondents to participate in all health services except health risk assessment, sickle cell screening, colorectal screening, blood sugar screening, and hearing tests. Exercise showed mixed results with female respondents scoring higher than male respondents on walking and aerobics, but lower than males respondents on jogging, bicycling, and gym exercise. The same pattern was found for continuation in exercise programs. Lifestyle changes also presented mixed results. Female respondents were more likely than male respondents to score high on diet changes (losing weight and improving nutrition) but were less likely than male respondents to stop smoking. The same pattern was found for continuation in lifestyle changes. Lastly, female respondents reported higher levels of wellness during the past 12 months than did male respondents. Compared to male respondents, female respondents reported that they were ill less often, exercised more, reduced stress more, reduced use of prescribed medication more, and stayed away from work due to illness less often.

Managerial Status. Managerial respondents were significantly different from non-managerial respondents on five of seven topic areas analyzed. Table 17 summarizes results for each topic area analyzed. As can be seen, canonical correlation coefficients accounted for between one and seven percent of between-group variance. Examining univariate analyses of variance, it was found that managerial respondents were more likely than non-managerial respondents to participate in all information programs except breast self-examination training, stop smoking, World AIDS

[4] If variables are not reported to be significantly different between one group and another (i.e., more/less likely), then the two groups were the same. This applies to the remainder of the report.

day, and cancer awareness. Similarly, managerial respondents were more likely than non-managerial respondents to participate in all health services except sickle cell screening and mammograms. Neither exercise levels nor exercise continuation showed significant between-group differences. Managers engaged in lifestyle changes significantly more than non-managers in all five areas. However, managerial respondents were more likely than non-managerial respondents to continue those changes only in reducing alcohol consumption and smoking. Finally, managerial and nonmanagerial respondents did not differ in self-reported wellness during the past 12 months except that non-managers reported a greater reduction in the use of prescribed medication than managers did.

DISCUSSION

The brevity of the survey instrument used in this study precludes addressing many questions regarding the efficacy and utility of HAPs per se. The answers to such questions were of secondary importance to the FAA. Assessing the level of participation in the various programs in FAA-HAP, identifying barriers to HAP participation, uncovering possible ways to enhance participation, and establishing a baseline estimate of FAA wellness all took precedence over linking wellness to HAP participation. Nevertheless, results presented a pattern of evidence indicating that HAP participants are healthier, exercise more, and lead healthier lifestyles than are nonparticipants. Such results, derived from baseline data, cannot establish the efficacy of FAA-HAP until confirmed by follow-up research.

Although participation included less than half of the employees randomly sampled, the 45% who responded to the survey provided ample statistical power to test hypotheses relevant to primary study goals. Because primary goals did not address differences in participant background, significant differences between the background characteristics of survey respondents (i.e., gender, age, region, and managerial status) and the FAA workforce are not problematic. However, readers might wish to draw conclusions about participant background factors. We pointed out that, although significant, background differences were small in magnitude. It is even possible, though not yet validated, that HAP participation may be a function of background characteristics, and that this might affect survey participation as well. We cited several studies reporting that HAP participants were generally older, more senior in position and tenure, and disproportionately female. Until this issue is more fully resolved in future research, we recommend caution when drawing conclusions based upon respondent background.

Generalizations about group differences not involving reference to respondent background characteristics should be accurate for guiding national resource, policy, and practice decisions. FAA-HAP participant/nonparticipant between-group differences reported here are also not likely to be affected by sampling error because both groups were almost evenly represented. Having both a sufficiently large sample and a 50-50 split on HAP participation minimizes statistical bias in testing between-group differences (Hays, 1973; Winer, 1971), and if anything, may be more likely to underestimate differences (Wilcox, 1998). Moreover, limiting factors normally associated with surveys, such as poor memory, tendencies to characterize one's health favorably or unfavorably, misinterpreting item meaning, should equally affect both HAP participants and nonparticipants.

Results are valid for meeting the sponsor's goals for this study. However, comparisons with results from any future surveys should take respondent characteristics into account. Managerial status, gender, age, and region should be used as covariates in comparisons to the baseline reported in this study.

Program Participation

Overall, 49.2% of respondents indicated participating in at least one HAP program. These results compare favorably with data reported by the National Coordinating Committee on Worksite Health Promotion (Office of Disease Prevention and Health Promotion, 1993) rates of 47% for a large chemical company (N=30,000), 32% for a large regional phone company (N=20,500), and 60% for a large manufacturer (N=43,500).

According to Baker, Israel, and Schurman, (1994), only about 15 to 20% of employees regularly participate in HAPs. The current study covered a period ranging from 8 to 10 years for most respondents depending on when FAA regional HAPs became functional. Because the survey did not inquire about the recency of participation in FAA-HAP, it is not possible to compare FAA data to the rate of Baker et al. However, at 49% participation over a 10-year period, the odds are that FAA's results are consistent

with Baker and associates' findings. Estimates of near-term participation rates will be possible at follow-up by limiting respondents to the time period since the baseline survey.

The generally low level of HAP participation in most organizations has led to calls for increased attention regarding how HAPs are marketed to employees (Powell, 1998). Such advice seems appropriate in the present case. The need for increased marketing of FAA-HAP is bolstered by results showing that the number one reason given for not participating in HAP was "never/rarely hear about HAP programs" (48% for information programs and 43.6% for service programs; Table 7). Factoring in the approximately 3% of respondents who indicated not getting sufficient notice about HAP events, as many as half of FAA employees may not be getting enough information about FAA-HAP.

Respondents who reported knowing about FAA-HAP first learned about the program from FAA medical personnel (20.3%) followed by printed flyers (14.6%), newsletters (14.2%), and lectures coincident with management training at CMD (13.4%). The remaining 37% of respondents heard about the program from any of 11 other sources. According to the data of Table 3, the most popular venues for first FAA-HAP participation were the flu shot program (23.9%), health fairs (22%), blood chemistry screening (12.7%), cholesterol screening (9.8%), and health awareness lectures (5.6%). Not surprisingly, Table 4 indicates that these were the programs in which respondents were most likely to participate.

Program Participation Influence on Subsequent HAP Participation

Analyses demonstrated that participation in either of the two most popular FAA-HAP information or service programs listed in Table 4 increased the likelihood of subsequent participation in another type of HAP program (Tables 5 and 6). These results validated the recursive model for HAP participation (Figure 1). These four programs also accounted for more than half of the venues in which respondents first participated in the HAP (Table 3). Anspaugh, Hunter, and Savage, (1996) report a list of popular HAP programs that is very similar to the FAA results. They recommend using popular programs as a vehicle for promoting other HAP programs and services.

Barriers and Enticements to HAP Participation

Broader participation in FAA-HAP among the workforce requires not only understanding why people participate in HAP, but also why they do not participate. Although fully a quarter of respondents reported no barriers to participation, almost half indicated "Never/rarely" hearing about HAP programs. Data presented in Table 7 shows that the type of HAP program was not a factor. Barriers were the same for both information and service programs. The FAA results were consistent with Wilson (1990), who identified promotion as key to employee HAP participation. On the other hand, other studies (Shephard, 1985; Serfass and Gerberich, 1984) have presented evidence that personal interest, time, social support, convenience of facilities, work conflicts, and self-perceived health can also be significant barriers to HAP participation. Although these latter factors are likely salient for some FAA employees, present results unambiguously support Wilson's position. Moreover, management exercises more control over promotional activities than it does over such factors as time availability and social support.

The second most common barrier to FAA-HAP participation (less than 9%) was lack of program availability in the respondents' geographic area. However, limited availability may be unavoidable given the large number of small facilities throughout each geographical region. The third most common barrier mentioned was workload (less than 6%). Consistent with Dishman (1986), workload barriers may be unavoidable and may not be cost effective to remedy. Such a small percentage suggests that most employees are able to arrange time away from work to participate in HAP. Nevertheless, the workload factor can be a double bind for those who could benefit from stress management workshops. They are most likely to perceive themselves as being too busy to participate. Stress management program coordinators might wish to consider how to accommodate to participant work demands when planning marketing strategies.

Employees were also asked to indicate which health/wellness promotion activities were most appealing. More than 50% of the respondents indicated health screening and high-involvement activities such as exercise and diets (Table 8), whereas only about 10% indicated health fairs and hands-on training were most appealing. Based upon reported participation

levels in Table 4, high-involvement activities do not seem to be consistent with stated customer preferences. Only about 25% of respondents reported attending high-involvement, hands-on training-type programs. This apparent paradox signals a need for caution when considering whether or not to reengineer FAA-HAP programs to increase personal involvement and more hands-on activities. The relationship between program attributes and participation rates is weak, and program changes might not be cost-effective. Lovato and Green (1990) have pointed out that changes in an organization's culture are most likely to increase employee participation in HAP activities. All things considered, marketing improvements are more likely to influence commonly held workforce values and beliefs (culture) than reengineering FAA-HAP. Therefore, a second wave of survey results should be obtained before significant reengineering efforts are considered.

Baseline Wellness Activities

In addition to learning about factors that influence customer participation, the survey also attempted to baseline workforce health and healthful activities. As stated earlier in this report, participant characteristics limit generalizability of baseline workforce health to current and future samples. However, these data are valid for testing hypotheses about the influence of FAA-HAP participation on wellness activities.

The data of Tables 9A and 9B suggest that, regardless of HAP participation, most FAA employees are exercising and engaging in healthful lifestyle activities. Nearly 70% of the respondents indicated involvement in some form of exercise program. Only 17% who started or continued in an exercise program dropped out during the past 24 months. These respondent exercise levels relate favorably to the 53% rate reported by Lamb and Brodie (1990) in their study of 1,677 adult sports participants and nonparticipants.

Results also show the important dynamic effect of beginning exercise on sustaining wellness behaviors. Overall continuation levels showed a strong relationship with whether or not a respondents had exercised beyond 18 months. Walking was by far the most popular activity, with 44.8% of respondents participating. Both swimming and skating (6.6% and 3.7% respectively) appeared to be "joiner" activities in that most people who started them dropped out within six months. Even activities exhibiting lower initial participation levels, for example, mix of activities, gym/fitness center, and walking (7 to 13.7%) had relatively high continuation levels beyond 18 months (53.4 to 67.5%). This pattern generally held for all activities, except skating and swimming. Such results invite speculation that skating and swimming may be less popular and sustain less involvement because they require special facilities that might impede enduring participation. Other forms of exercise with high levels of continuation (e.g., gym/fitness center), also involve special facilities, but swimming and skating facilities may be less available and less convenient. Another explanation would be that skating and swimming are more popular with an age group that is underrepresented in the FAA workforce.

Results presented in Table 10 indicate a significant relationship between FAA-HAP participation and respondent exercise activities. Although between-group differences were small, the trend was consistent. FAA-HAP participants reported approximately 16% higher exercise levels (on average). However, there was no significant relationship between FAA-HAP participation and continuation in exercise programs. This result does not mean that a relationship does not exist. A significant relationship can be masked by a substantial percentage of respondents having a long history of regular exercise even before HAP was introduced. Alternatively, it may be too early for the influence of HAP participation to be manifested in differences in adherence to a program of regular exercise.

The significant relationship between continuation in exercise and having exercised for longer than 18 months raises the possibility that exercise results can be affected by lifestyle activities established prior to the 24-month window examined in this study. However, long-term exercise participation seems unlikely to negate the relationships found between exercise rates and HAP participation. One might expect that people with a long history of regular exercise would have less motivation than non-exercisers to participate in FAA-HAP because they already maintain a high level of health awareness.

Shifting attention to lifestyle changes, results show that nearly 60% of respondents engaged in some form of healthful lifestyle change during the previous 24 months, and most (53.9%) were persevering. As was the case for exercise, results show that, the longer respondents adhered to a lifestyle changes, the greater the likelihood that they would continue adherence

after 18 months. Changes in food intake, both quantity (dieting) and quality (nutrition) were most commonly reported. The distribution of respondents across every level of participation was flatter for lifestyle activities than for exercise activities. Stress reduction had the second-highest lifestyle adherence level beyond 18 months (56.2%), and the highest level of continuation (95.2%). Consistent with the exercise results, HAP participants reported significantly more lifestyle change and continuation of change than did nonparticipants. Again, as was the case for exercise, these results might be influenced by changes begun prior to the 24-month window of the survey. However, if prior changers were less likely to participate in FAA-HAP, then participant levels should be lower than nonparticipants, not higher. If prior changers were more likely to participate in FAA-HAP, then there should have been disproportionately more participants in the high range (18 to 24 months) of the participation distribution. Given the flatness of the participation distribution across time periods, this simply cannot be the case.

Finally, although results indicate a significant relationship between FAA-HAP participation and self-reported exercise and lifestyle changes, the percentage of covariance was small. The small amount of variance accounted for by HAP participation is likely due to restriction of variance caused by the checklist nature of most survey items (i.e., dichotomous and/or many zero or missing responses).

Baseline Health Status

Additional evidence that FAA-HAP had an influence on agency health status would help to bolster confidence that FAA-HAP was a contributing factor. Results presented in Table 13 provide such evidence. In the multivariate sense, FAA-HAP participants were, on average, 15% more likely to have reported positive changes in their health status during the previous 12 months than were nonparticipants. Changes significantly affected seven of the nine areas addressed by the survey. Only aerobic fitness and weight loss averages did not significantly differ between participant/nonparticipant groups in the univariate sense.

Almost 70% of respondents reported having had a physical examination during the previous 18 months, although 7.5% were line-of-duty physicals. These results compare favorably with a 1993 report from the National Health Interview Survey (cited in Woolf, Jonas, & Lawrence, 1995) that reported 78% of respondents of working age (18 to 64 years) had a routine physical during the previous 36 months. Perhaps the most positive results are those that indicated potentially life-saving outcomes for 51 respondents. Those respondents discovered a previously unknown medical problem because of an FAA-HAP health screening. Although detection of a medical problem occurred for a very small percentage of total respondents, the preservation of health and wellness presents a powerful justification for continuation of FAA-HAP.

Background Differences

Results indicate that survey participation was affected by age, gender, and managerial status. Although 39.3% of the workforce were over age 45, another 25% of the respondents (49.5%) were over 45. Only 24.1% of the workforce were female, but 17% more of the respondents (28.3%) were female. Finally, managers comprised 10.7% of the workforce, but 50% more of the respondents (15.7%) were managers. These background differences may not be due as much to sampling error as factors associated with varying interest in health awareness due to background.

The characteristics of respondents to an earlier survey of federal employee HAP programs (Crump et al., 1996) tended to be older than the target population. They also appeared to be more managerial in that their educational achievements were disproportionally higher than the general workforce (Carter, Omenn, Martin, Crump, Grunbaum, and Williams, 1995). Similarly, participation in the AT&T health Total Life Concept program (Holt, McCauley, & Paul, 1995) was disproportionally female, older (c. 40), and managerial. Study participants in the Duke University employee Live for Life HAP (Goetzel, Kahr, Aldana, & Kenny, 1996) were older (75% over age 35), and more were female (70%). Finally, a review of HAP participants by Wilson (1990) concluded that, compared to the general workforce, they were more educated, had higher incomes (ergo, more likely to be managerial), were older, and more likely to be female.

Authors such as Furnham and Kirkcaldy (1997) and Edington, Sharp, Vreeken, Yen, and Edington (1997) have attributed differences in the backgrounds

of HAP participants to differences in their health interests. For example, as employees move into middle age, they and their associates are more likely to experience illnesses such are coronary thrombosis, skin cancer, colon cancer, etc. This phenomena may increase interest in personal health behaviors among older employees. Likewise, females of childbearing age are generally more likely than males to consult with physicians on a regular basis (Centers for Disease Control, 1995). Frequent physician visits might lead to increased interest in health behaviors among female employees.

Small, but significant relationships were found to exist between all three background characteristics and HAP participation. This would indicate that survey participation may have been influenced by interest in wellness and health issues, and at least to some extent HAP in particular. Sampling differences due to age and gender appear to be consistent with the cited literature indicating a relationship between background and health interests. Although managerial status differences might be influenced by educational achievement, as previous studies have found, they may also be caused by the FAA's mandatory health awareness training for supervisory personnel who attend the Center for Management Development (CMD).

With respect to specific subgroup differences, it must be pointed out that the amount of between-group variance explained in the analyses reported here for age, gender, and managerial status is quite small. Nevertheless, results indicate that younger employees, male employees, and nonmanagers are less likely to participate in FAA-HAP information and service programs. Older employees were less likely to engage in exercise programs than younger ones, although both age groups were similar for walking and swimming. Nonmanagerial employees seem to engage in lifestyle changes less than managers. Younger employees, male employees, and nonmanagerial employees seem to diet less. Older employees and nonmanagers were less likely than younger employees and managers to report efforts to reduce alcohol consumption. Nonmanagerial employees and female employees were less likely to report efforts to reduce smoking than managers and male employees.

CONCLUSIONS

HAP participation in FAA seems to be typical for most worksite programs. Participation appears to have reached only about half of the workforce since 1989. Participation levels in FAA-HAP are due, in part, to HAP marketing being insufficient to allow employees to know what HAP programs are available and when they are scheduled. Survey respondents were different from the workforce in that they were somewhat older, disproportionately female, and more likely to hold managerial positions. These differences may be caused the representativeness of the respondent pool, or (as argued here), they may typify those segments of the workforce most interested in health and wellness. Several significant differences in health and wellness results related to age, gender, and managerial status, as was participation in HAP.

When examining health outcomes, HAP participants were significantly more likely to exercise, engage in healthy lifestyle changes, and report a high level of wellness. Though hardly a definitive evaluation of HAP, this baseline study found a positive effect for HAP participation for every factor examined and nearly every variable tested. This initial finding still needs to be further validated in a follow-up study.

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FIGURES

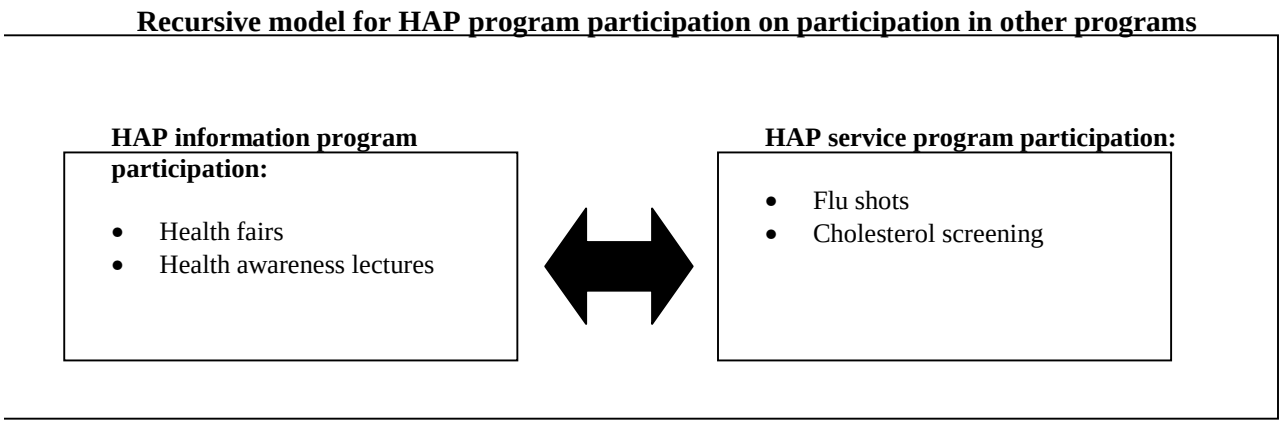

Figure 1. Causal model depicting the likelihood that participation in one type of HAP program may influence participation in another type of HAP program.

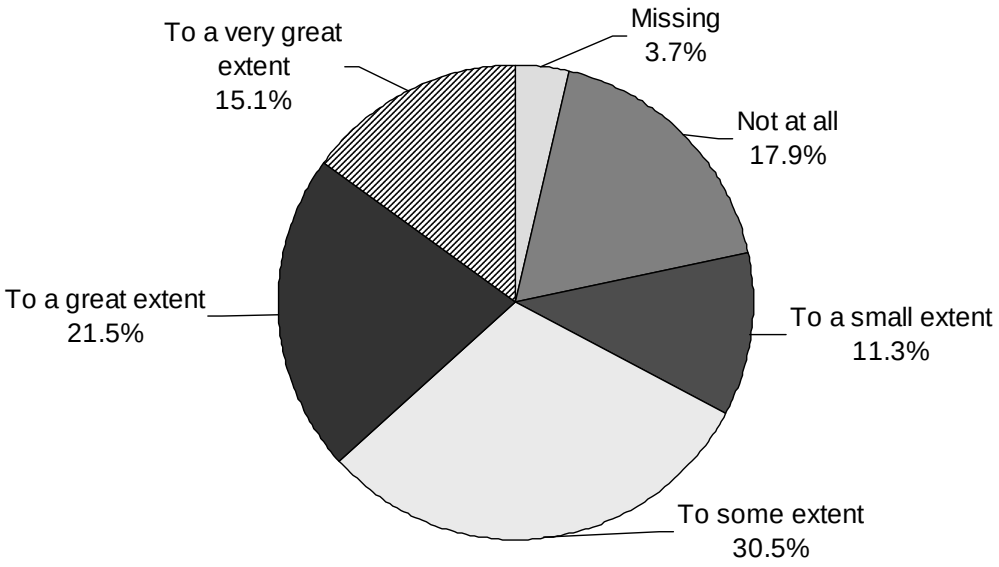

Figure 2. Interest in health monitoring participation

TABLES

Table 1

Summary of FAA-HAP activities and interventions.[1]

Level I	Level II	Level III
• Health Fair • Health Awareness Lectures (e.g., lowering cholesterol, managing stress, healthy lifestyle) • Medical Information Videos (e.g., living with diabetes, heart attack, first aid) • Medical Information Pamphlets • Breast Self-examination Training for Early Cancer Detection • Testicle Self-examination Training for Early Cancer Detection • World AIDS Day • Alcohol Awareness Programs • Cancer Awareness Programs • Stress Management Awareness Programs	• Walking for Health Programs • Weight Management Programs/Nutrition Awareness Programs • Stop Smoking Programs • Blood Pressure Screening • Cholesterol Screening • Blood Chemistry Screening • Body Fat Measurement • Sickle Cell Screening • Colorectal (Occult Blood) Screening • Mammogram • Annual Flu Shot Program • Glaucoma & Vision Testing • Blood Sugar/Diabetes Screening • Hearing Tests	• Fitness Awareness Programs • Health Risk Assessment • Incorporation of Wellness Topics in Managerial and Technical Training Curricula • Requiring "Healthy Choice" Cafeteria Options • Posting Nutrition Information in Cafeterias • Employee Fitness Centers (limited to larger facilities)[2] • Employee Assistance Program[2] • On-site Clinics (limited to larger facilities)

1. *Levels, following Pencak's 1991 model.*
2. *Sponsored by the Office of Human Resources or local facility managers*

Table 2

FAA-HAP survey participants described by age, gender, managerial status, and geographical region (N = 3,262).

	Respondents (%)	FAA Population (%)	χ^2	Sig.
Age				
Under 45	51.5	60.7	117.52	$p < .001$
Over 45	49.5	39.3		
Gender				
Male	71.7	75.9	31.60	$p < .001$
Female	28.3	24.1		
Managerial Status				
Manager	15.7	10.7	85.50	$p < .001$
Nonmanager	84.3	89.3		
Regional Sampling Units			50.96	$p < .001$
Alaskan	3.1	3.1		
Central	6.4	5.1		
Eastern	10.7	10.8		
Great Lakes	13.8	13.3		
New England	3.8	3.9		
Northwest Mountain	10.4	8.6		
Southern	14.9	16.0		
Southwest	10.9	10.9		
Western-Pacific	12.1	11.4		
Aeronautical Center	5.8	5.9		
Washington HQ	6.2	7.6		
Hughes Technical Center	1.9	3.2		

Table 3

Ways by which respondents first learned about FAA-HAP and the first program in which they participated.

Percent (N = ,193)	First Learned of HAP from:	Percent (N = 1,369)	First Participation
20.3	My local FAA **medical representative** (e.g., occupational nurse, flight surgeon, local clinic staff)	23.9	Annual Flu Shot Program
		22.0	Health Fair
		12.7	Blood Chemistry Screening
14.6	A **flyer** announcing screening	9.8	Cholesterol Screening
14.2	In an agency **newsletter** (Intercom, Regional Newsletter, HOPE, Vitality, etc.)	5.6	Health Awareness Lectures
		4.5	Blood Pressure Screening
13.4	**CMD** (e.g., Health Risk Assessment, wellness lectures)	4.1	Health Risk Assessment
		3.6	Body Fat Measurement
8.1	A **pamphlet**	3.2	Hearing Tests
7.2	Some **other** source	2.3	Stress Management Awareness
6.0	**Coworkers**	1.4	Medical Information Videos)
5.2	**Health Fair**	1.3	Stop Smoking Programs
4.9	A **flyer** announcing lectures/information/training	1.0	Fitness Awareness Programs
		.8	Weight Management
2.8	My **supervisor/manager**	.8	Glaucoma / Vision Testing
1.4	A **Volunteer** Field HAP Representative/Contact	.7	Walking For Health Programs
		.6	Mammogram
1.0	Local agency-sponsored **fitness program/center** referral	.4	Blood Sugar/Diabetes
		.3	Breast Self-examination
.6	Employee Assistance Program (**EAP**)referred me	.3	Testicle Self-examination
		.3	Alcohol Awareness Programs
.1	My **safety coordinator**	.3	Cancer Awareness Programs
.1	**Video**/HAP Video library	.2	World Aids Day
		.1	Colorectal Screening
		.0	Sickle Cell Screening

Table 4

HAP program participation levels described by program type (information and service).

Percent of Total (N = 3,262)	Percent of Program Participants* (N = 1,082)	Information Programs
21.5	64.7	Health Fair
12.9	38.9	Health Awareness Lectures (e.g., lowering cholesterol, managing stress, healthy lifestyle)
7.9	23.8	Stress Management Awareness Programs
5.5	16.5	Fitness Awareness Programs
4.4	13.2	Weight Management Programs/Nutrition Awareness Programs
3.9	11.6	Medical Information Videos (e.g., living with diabetes, heart attack, first aid)
3.2	9.6	Walking For Health Programs
2.4	7.3	Stop Smoking Programs
2.2	6.7	Alcohol Awareness Programs
1.9	5.8	Cancer Awareness Programs
1.7	5.1	Breast Self-examination Training for Early Cancer Detection
1.3	3.8	Testicle Self-examination Training for Early Cancer Detection
1.3	3.9	World AIDS Day

Percent of Total (N = 3,262)	Percent of Program Participants* (N = 1,082)	Service Programs
23.4	54.9	Annual Flu Shot Program
20.8	48.8	Cholesterol Screening
17.5	40.2	Blood Chemistry Screening
17.1	41.0	Blood Pressure Screening
12.7	29.7	Body Fat Measurement
7.6	17.8	Health Risk Assessment (questionnaire and feedback)
7.4	17.2	Hearing Tests
4.5	10.6	Glaucoma Screening/Vision Testing
4.3	10.0	Blood Sugar/Diabetes Screening
1.5	3.6	Mammogram
1.3	3.1	Colorectal (Occult Blood) Screening
.2	.4	Sickle Cell Screening

**Note: N refers to all respondents who indicated participation in 1 or more HAP information or service programs.*

Table 5

Multivariate discriminant analyses examining the interrelationship of participation in the two most popular information programs on participation in service programs.

Service Program Effects on Information Programs	R_c		χ^2	Sig.
Health Fairs	.45		746.84	*.000*
(700 participants/2562 nonparticipants)	Participant Average	Function Weights	Nonparticipant Average	1-Way Sig.
Blood pressure	.43	**.75**	.10	*.000*
Cholesterol	.48	**.71**	.14	*.000*
Blood chemistry	.42	**.69**	.11	*.000*
Health risk assessment	.21	**.56**	.04	*.000*
Body fat Measurement	.28	**.50**	.08	*.000*
Annual flu shot	.43	**.49**	.18	*.000*
Health Awareness Lectures	.51		961.34	*.000*
(421 participants/2841 nonparticipants)	Participant Average	Function Weights	Nonparticipant Average	1-Way Sig.
Cholesterol	.63	**.74**	.15	*.000*
Blood pressure	.55	**.71**	.12	*.000*
Health risk assessment	.32	**.65**	.04	*.000*
Body fat	.42	**.62**	.08	*.000*
Blood chemistry	.44	**.47**	.14	*.000*
Blood sugar/diabetes screening	.17	**.42**	.02	*.000*

Table 6

Multivariate discriminant analyses of the two most popular service programs to examine the interrelationship of participation in service programs on participation in information programs.

Information Program Effects on Service Programs	R_c		χ^2	Multiv. Sig.
Flu Shots	.31		338.41	*.000*
(760 participants/2498 nonparticipants)	Participant Average	Function Weights	Nonparticipant Average	Univ. Sig.
Health fair	.39	**.75**	.16	*.000*
Health awareness lectures	.27	**.70**	.09	*.000*
Stress Management	.15	**.46**	.06	*.000*
Fitness Awareness	.11	**.43**	.02	*.000*
Weight management	.09	**.43**	.03	*.000*
Medical Information videos	.09	**.42**	.02	*.000*
Cholesterol Screening	.49		872.29	*.000*
(679 participants/2583 nonparticipants)	Participant Average	Function Weights	Nonparticipant Average	Univ. Sig.
Health Awareness lectures	.39	**.78**	.06	*.000*
Health fairs	.49	**.65**	.14	*.000*
Stress management	.22	**.49**	.04	*.000*
Fitness awareness	.17	**.47**	.03	*.000*
Weight management	.14	**.44**	.02	*.000*
Medical information videos	.11	**.33**	.02	*.000*

Table 7

Barriers to program participation broken down by type of program.

Information Programs.		Service Programs.	
Percentage *(N = 2,939)*	Response	Percentage *(N = 2,966)*	Response
48.0	NEVER/RARELY HEAR about HAP programs	43.6	NEVER/RARELY HEAR about HAP programs
24.6	There are NO BARRIERS	25.9	There are NO BARRIERS
8.2	Programs are NEVER/RARELY AVAILABLE in my area	9.3	Programs are NEVER/RARELY AVAILABLE in my area
5.6	My WORKLOAD is too heavy	5.4	My WORKLOAD is too heavy
3.2	INSUFFICIENT NOTICE to arrange my schedule	3.6	INSUFFICIENT NOTICE to arrange my schedule
2.8	Program LOCATIONS are not convenient	3.1	Program LOCATIONS are not convenient
1.7	Other (describe)	1.8	I'M HEALTHY enough -- I don't think I need any additional activities/programs
1.6	I'M HEALTHY enough -- I don't think I need any additional activities/programs	1.4	Other (describe)
1.2	My SUPERVISOR will not allow work time to participate	1.2	My SUPERVISOR will not allow work time to participate
1.0	NOT RELEVANT to my personal health	1.1	MEDICAL CARE and information from elsewhere
.9	MEDICAL CARE and information from elsewhere	.9	NOT RELEVANT to my personal health
.6	DISINTEREST -- I don't care about health matters	.7	DISINTEREST -- I don't care about health matters
.2	WORRIED that I might learn I have a health problem	.3	PROGRAM QUALITY -- I don't think the programs are very good
.1	PROGRAM QUALITY -- I don't think the programs are very good	.2	WORRIED that I might learn I have a health problem
.1	My MEDICAL CONDITION will not allow participation	.1	My MEDICAL CONDITION will not allow participation

Table 8

Health/wellness activities that most appeal to FAA employees.

Health/wellness Activity	Percentage *(N = 2,457)*
1. Health screening	28.9
2. High involvement activities	26.5
3. Health fairs	11.1
4. Hands-on training	10.3
5. Pamphlets, books	8.7
6. Videos	5.9
7. Lectures	4.8
8. Other	3.7

Table 9A

Summary of self-reported participation in types of vigorous exercise of 30 minutes duration or more, at least three or more times per week, broken down by type of exercise and duration for all 3,262 respondents.

	Participation Levels for All Respondents (%)											
	Reporting any participation		A few days	A few weeks	3-12 weeks	3-6 months	7-12 months	13-18 months	19-24 months	Continuing? I am still doing this.		Still doing after 18 months
	Sample											
Type of Exercise	*N*	*%*								*N*	*%*	%
Walking	*1,460*	*44.8*	6.1	4.0	4.7	4.3	4.2	3.0	18.5	*1,144*	*35.1*	17.0
A mix of fitness activities	*841*	*25.8*	1.8	1.7	2.2	2.5	1.6	1.3	14.7	*721*	*22.1*	13.4
Gym/fitness ctr. Workouts	*678*	*20.8*	1.6	1.4	2.0	3.0	1.9	1.1	9.8	*524*	*16.1*	9.0
Jogging	*502*	*15.4*	2.9	0.8	1.4	1.5	1.1	0.6	7.1	*336*	*10.3*	6.2
Bicycling	*416*	*12.8*	2.5	1.2	1.3	1.7	1.0	0.7	4.5	*275*	*8.4*	4.1
Aerobics	*265*	*8.1*	1.3	0.6	0.9	0.9	0.5	0.7	3.4	*175*	*5.4*	2.2
Swimming	*216*	*6.6*	2.5	0.5	0.8	0.8	0.6	0.3	1.2	*87*	*2.7*	0.9
Skating	*120*	*3.7*	1.7	0.3	0.3	0.3	0.2	0.2	0.6	*40*	*1.2*	0.4
Report 1 or more (Total)	*2,253*	*69.0*										

Table 9B

Summary of self-reported participation levels for types of vigorous exercise of 30 minutes duration or more, at least three or more times per week, broken down by type of exercise and duration for respondent exercisers only.

	Participation Levels for Exercisers (%)											
	N Reporting any participation		A few days	A few weeks	3-12 weeks	3-6 months	7-12 months	13-18 months	19-24 months	Continuing? I am still doing this.		Still doing after 18 months
	Relative											
Type of Exercise	*N*	*%*								*N*	*%*	
Walking	*1,460*	*32.5*	13.7	8.8	10.5	9.7	9.4	6.6	41.2	*1,144*	*78.4*	53.4
A mix of fitness activities	*841*	*18.7*	7.0	6.4	8.6	9.8	6.1	5.2	56.9	*721*	*85.7*	67.5
Gym/fitness ctr. workouts	*678*	*15.1*	7.7	6.9	9.4	14.5	9.1	5.3	47.1	*524*	*77.3*	61.0
Jogging	*502*	*11.2*	18.9	5.4	9.2	9.6	7.0	3.8	46.2	*336*	*66.9*	65.6
Bicycling	*416*	*9.2*	19.2	9.6	9.9	13.5	7.5	5.3	35.1	*275*	*66.1*	52.2
Aerobics	*265*	*5.9*	16.2	6.8	10.6	10.6	6.0	8.3	41.5	*175*	*66.0*	58.7
Swimming	*216*	*4.8*	37.0	7.9	12.0	12.0	8.8	4.2	18.1	*87*	*40.3*	36.4
Skating	*120*	*2.7*	46.7	8.3	8.3	7.5	6.7	5.8	16.6	*40*	*33.3*	30.6
Report 1 or more (Total)	*2,253*	*100.0*										

Table 10

Multiple Discriminant Analysis comparing FAA-HAP participants and nonparticipants on participation levels in exercise programs and continuation in exercise programs.

Participation Effects on Exercise	R_c		χ^2	Multiv. Sig.
Exercise Participation	.09		24.50	*.002*
(1605 participants/1657 nonparticipants)	Participant Average	Function Weights	Nonparticipant Average	Univ. Sig.
Walking	2.30	**.66**	1.98	*.001*
Jogging	0.84	**.60**	0.63	*.003*
Skating	0.14	**.37**	0.08	*.068*
Swimming	0.25	**.35**	0.19	*.080*
Bicycling	0.60	**.28**	0.52	*.173*
Aerobics	0.41	**.15**	0.37	*.448*
A mix of fitness activities	1.39	**.08**	1.42	*.677*
Gym/fitness ctr. workouts	1.08	**.06**	1.06	*.768*
Exercise Continuation	.07		13.96	*.083*
(1605 participants/1657 nonparticipants)	Participant Average	Function Weights	Nonparticipant Average	Univ. Sig.
Walking	0.38	**.77**	0.33	*.004*
Jogging	0.11	**.51**	0.09	*.055*
Aerobics	0.06	**.37**	0.05	*.167*
Bicycling	0.09	**.33**	0.08	*.222*
A mix of fitness activities	0.22	**.19**	0.22	*.487*
Swimming	0.03	**.07**	0.03	*.795*
Gym/fitness ctr. workouts	0.16	**.05**	0.16	*.862*
Skating	0.01	**.03**	0.01	*.919*

Table 11A

Summary of self-reported lifestyle changes, broken down by type of change and duration for all 3,262 respondents.

			Participation Levels for All Respondents (%)									
	Reporting any participation									Continuing? I am still doing this.		Still doing after 18 months
	Sample		A few days	A few weeks	3-12 weeks	3-6 months	7-12 months	13-18 months	19-24 months			
Types of Change	*N*	*%*								*N*	*%*	
Diet to improve nutrition	*1,208*	*37.0*	2.4	2.8	4.4	3.9	4.0	2.6	16.9	*993*	*30.4*	15.7
Weight loss/diet	*944*	*28.9*	3.1	4.4	5.2	4.4	2.8	1.6	7.5	*646*	*19.8*	6.6
Reduced stress	*662*	*20.2*	1.9	1.1	1.1	1.7	1.9	1.2	11.4	*551*	*16.9*	10.5
Reduced alcohol intake	*427*	*13.1*	1.1	0.7	1.1	1.1	1.3	0.7	7.2	*339*	*10.4*	6.4
Reduced smoking	*402*	*12.3*	1.4	0.9	1.1	1.3	0.9	0.9	5.9	*297*	*9.1*	5.0
Report 1 or more (total)	*1,918*	*58.8*										

Table 11B

Summary of self-reported lifestyle changes, broken down by type of change and duration for respondent who reported change only.

			Participation Levels for Changers (%)									
	Reporting any participation									Continuing? I am still doing this.		Still doing after 18 months
	Relative		A few days	A few weeks	3-12 weeks	3-6 months	7-12 months	13-18 months	19 to 24 months			
Type of Change	*N*	*%*								*N*	*%*	
Diet to improve nutrition	*1,208*	*33.0*	6.5	7.5	12.0	10.6	10.9	7.0	45.5	*993*	82.0	38.7
Weight loss/diet	*944*	*25.9*	10.6	15.3	17.9	15.4	9.5	5.5	25.8	*646*	68.4	21.5
Reduced stress	*662*	*18.2*	9.5	5.4	5.6	8.2	9.2	5.9	56.2	*551*	83.2	46.1
Reduced alcohol intake	*427*	*11.7*	8.2	5.4	8.2	8.7	9.6	5.2	54.8	*339*	79.4	43.5
Reduced smoking	*402*	*11.0*	11.4	7.5	8.7	10.9	7.0	7.0	47.5	*297*	73.9	35.6
Report 1 or more (Total)	*1,918*	*100.0*										

Table 12

Multiple Discriminant Analysis comparing HAP participants and nonparticipants on participation levels in lifestyle change programs and continuation in lifestyle change programs.

Participation Effects on Lifestyle Changes	R_c		χ^2	Multiv Sig.
Change Participation	.09		27.58	*.000*
Lifestyle Changes	Participant Average	Function Weights	Nonparticipant Average	Univ. Sig.
Diet to improve nutrition	2.14	**.90**	1.68	*.000*
Reduced stress	1.24	**.60**	0.98	*.002*
Weight loss/diet	1.31	**.48**	1.11	*.011*
Reduced alcohol intake	0.75	**.25**	0.66	*.189*
Reduced smoking	0.63	**.05**	0.61	*.757*
Change Continuation	.06		24.5	*.002*
Lifestyle Changes	Participant Average	Function Weights	Nonparticipant Average	Univ. Sig.
Diet to improve nutrition	0.38	**.80**	0.30	*.000*
Reduced stress	0.22	**.63**	0.17	*.000*
Reduced alcohol intake	0.13	**.33**	0.11	*.039*
Weight loss/diet	0.23	**.26**	0.20	*.113*
Reduced smoking	0.10	**.13**	0.11	*.421*

Table 13

Percentage of respondents indicating positive changes in health status during the past 12 months.

In the past 12 months, have you...	Percent Yes
Become more muscular?	45.4
Started a program to reduce stress?	42.6
Reduced use or dosage of prescribed medication?	34.0
Lost weight to come closer to your ideal weight?	33.8
Been ill less often than in past years?	32.5
Felt more energetic than in past years?	29.2
Stayed away from work due to illness less often?	23.9
Been exercising more often?	20.5
Become more aerobically fit?	20.0

Table 14

Multiple Discriminant Analysis comparing HAP participants and nonparticipants on self-reported changes in health status during the past 12 months.

Participation Effects on Exercise	R_c		χ^2	Multiv Sig.
Health Status Changes*	.11		28.19	*.001*
In the past 12 months, have you...	Participant Percent	Function Weights	Nonparticipant Percent	Univ. Sig.
Been ill less often than in past years?	.42	**.71**	.35	*.000*
Started a program to reduce stress?	.21	**.65**	.15	*.001*
Reduced use or dosage of prescribed medication?	.21	**.52**	.17	*.005*
Stayed away from work due to illness less often?	.33	**.48**	.28	*.010*
Felt more energetic than in past years?	.31	**.46**	.25	*.014*
Become more muscular?	.22	**.39**	.19	*.039*
Been exercising more often?	.43	**.39**	.39	*.039*
Become more aerobically fit?	.27	**.35**	.24	*.060*
Lost weight to come closer to your ideal weight?	.30	**.12**	.29	*.536*

**Note: Percentages may differ from overall percentages due to listwise deletion of missing data, i.e., any missing data on these nine items resulted in case elimination.*

Table 15

Multiple Discriminant Analysis comparing older (over 45 years) and younger (under 45 years) respondents on wellness behaviors.

Wellness Topic Area	R_c	χ^2	Multiv. Sig.
Information Services Program Participation[1]	.13	51.68	*.001*
Health Services Program Participation[2]	.17	89.56	*.001*
Exercise Participation[3]	.19	122.77	*.001*
Exercise Continuation[4]	.18	102.63	*.001*
Lifestyle Changes[5]	.11	36.21	*.001*
Lifestyle Change Continuation[6]	.11	38.89	*.001*
Self-reported Wellness[7]	.11	23.64	*.005*

[1] Items 1-13; [2] Items 14-25; [3] Exercise items 7-14; [4] Exercise continuation items 7-14; [5] Lifestyle items 15-19; [6] Lifestyle continuation items 15-19; and [7] Wellness items (past 12 months) 24-32

Table 16

Multiple Discriminant Analysis comparing male and female respondents on wellness behaviors.

Wellness Topic Area	R_c	χ^2	Multiv. Sig.
Information Services Program Participation[1]	.18	101.48	*.001*
Health Services Program Participation[2]	.14	58.50	*.001*
Exercise Participation[3]	.18	99.75	*.001*
Exercise Continuation[4]	.17	93.10	*.001*
Lifestyle Changes[5]	.08	14.69	*.012*
Lifestyle Change Continuation[6]	.11	41.94	*.001*
Self-reported Wellness[7]	.11	26.40	*.002*

[1] Items 1-4, 7-13; [2] Items 14-20, 22-25; [3] Exercise items 7-14; [4] Exercise continuation items 7-14; [5] Lifestyle items 15-19; [6] Lifestyle continuation items 15-19; and [7] Wellness items (past 12 months) 24-32 .

Table 17

Multiple Discriminant Analysis comparing managers and nonmanagers on wellness behaviors.

Wellness Topic Area	R_c	χ^2	Multiv. Sig.
Information Services Program Participation[1]	.24	194.32	*.001*
Health Services Program Participation[2]	.26	224.71	*.001*
Exercise Participation[3]	.07	14.73	*ns*
Exercise Continuation[4]	.05	7.56	*.ns*
Lifestyle Changes[5]	.09	23.78	*.001*
Lifestyle Change Continuation[6]	.06	11.55	*.04*
Self-reported Wellness[7]	.10	21.25	*.01*

[1] Items 1-13; [2] Items 14-25; [3] Exercise items 7-14; [4] Exercise continuation items 7-14; [5] Lifestyle items 15-19; [6] Lifestyle continuation items 15-19; and [7] Wellness items (past 12 months) 24-32 .

APPENDIX A

FAA Health Awareness Program
Customer Service Assessment

FAA HEALTH AWARENESS PROGRAM CUSTOMER SERVICE ASSESSMENT

1. Until now, were you aware that the FAA Office of Aviation Medicine sponsors a Health Awareness Program (HAP) that provides information and services to promote employee wellness?

   ○ I have been AWARE of HAP ○ I never heard of HAP before I got this survey

HAP INFORMATION PROGRAM

2. From the list of HAP-related information programs, please indicate those in which you have participated: **[Mark ALL that apply]**

   ○ 1. Health Fair
   ○ 2. Health Awareness Lectures (e.g., lowering cholesterol, managing stress, healthy lifestyle)
   ○ 3. Medical Information Videos (e.g., living with diabetes, heart attack, first aid)
   ○ 4. Walking for Health Programs
   ○ 5. Breast Self-examination Training for Early Cancer Detection
   ○ 6. Testicle Self-examination Training for Early Cancer Detection
   ○ 7. Weight Management Programs/Nutrition Awareness Programs
   ○ 8. Stop Smoking Programs
   ○ 9. World AIDS Day
   ○ 10. Alcohol Awareness Programs
   ○ 11. Cancer Awareness Programs
   ○ 12. Fitness Awareness Programs
   ○ 13. Stress Management Awareness Programs

HAP PROGRAM SERVICES

3. From the list of HAP-related program services, please indicate those in which you have participated: **[Mark ALL that apply]**

   ○ 14. Health Risk Assessment (questionnaire and feedback)
   ○ 15. Blood Pressure Screening
   ○ 16. Cholesterol Screening
   ○ 17. Blood Chemistry Screening
   ○ 18. Body Fat Measurement
   ○ 19. Sickle Cell Screening
   ○ 20. Colorectal (Occult Blood) Screening
   ○ 21. Mammogram
   ○ 22. Annual Flu Shot Program
   ○ 23. Glaucoma Screening/Vision Testing
   ○ 24. Blood Sugar/Diabetes Screening
   ○ 25. Hearing Tests

4. Which of the above 25 programs was your FIRST CONTACT with HAP? ➡ ☐☐ Print Number Here

   ○ Not applicable I have not yet had any contact with HAP

BARRIERS TO HAP PARTICIPATION

5. Regardless of whether or not you have participated, please indicate your BIGGEST BARRIER to participation in HAP INFORMATION PROGRAMS as described in **items 1-13** on the previous page. **[Please mark ONLY ONE answer]**

- ○ a) There are NO BARRIERS
- ○ b) INSUFFICIENT NOTICE to arrange my schedule
- ○ c) NEVER/RARELY HEAR about HAP programs
- ○ d) Programs are NEVER/RARELY AVAILABLE in my area
- ○ e) Program LOCATIONS are not convenient
- ○ f) My SUPERVISOR will not allow work time to participate
- ○ g) My WORKLOAD is too heavy
- ○ h) NOT RELEVANT to my personal health
- ○ i) DISINTEREST -- I don't care about health matters
- ○ j) PROGRAM QUALITY -- I don't think the programs are very good
- ○ k) I'm HEALTHY enough -- I don't think I need any additional activities/programs
- ○ l) I'm WORRIED that I might learn I have a health problem
- ○ m) My MEDICAL CONDITION will not allow participation
- ○ n) Other (describe) _____

6. Regardless of whether or not you have participated, please indicate your BIGGEST BARRIER to participation in HAP PROGRAM SERVICES as described in **items 14-25** on the previous page. **[Please mark ONLY ONE answer]**

- ○ a) There are NO BARRIERS
- ○ b) INSUFFICIENT NOTICE to arrange my schedule
- ○ c) NEVER/RARELY HEAR about HAP programs
- ○ d) Programs are NEVER/RARELY AVAILABLE in my area
- ○ e) Program LOCATIONS are not convenient
- ○ f) My SUPERVISOR will not allow work time to participate
- ○ g) My WORKLOAD is too heavy
- ○ h) NOT RELEVANT to my personal health
- ○ i) DISINTEREST -- I don't care about health matters
- ○ j) PROGRAM QUALITY -- I don't think the programs are very good
- ○ k) I'm HEALTHY enough -- I don't think I need any additional activities/programs
- ○ l) I'm WORRIED that I might learn I have a health problem
- ○ m) My MEDICAL CONDITION will not allow participation
- ○ n) Disqualification (e.g., concerned I might be physically disqualified from my job)
- ○ o) Other (describe) _____

WELLNESS ACTIVITIES

Generally, there are two types of wellness activities, exercise programs and lifestyle changes. We are interested in learning if you have initiated involvement in any wellness activities regardless of HAP's influence. To classify as a wellness activity, exercise must involve vigorous activity for at least 30 minutes 3 or more times each week.

Please indicate (a) how long you have engaged in the following wellness activities within the past 24 months, and (b) if you are continuing the activities.	How Long?							Continuing?	
	A few days	A few weeks	3-12 weeks	3-6 months	7-12 months	13-18 months	19-24 months		I AM STILL DOING THIS
Exercise Programs									
7. Walking (at least 3 times each week)	a. ○	○	○	○	○	○	○	b.	○
8. Jogging (at least 3 times each week)	a. ○	○	○	○	○	○	○	b.	○
9. Swimming (at least 3 times each week)	a. ○	○	○	○	○	○	○	b.	○
10. Bicycling (at least 3 times each week)	a. ○	○	○	○	○	○	○	b.	○
11. Skating (at least 3 times each week)	a. ○	○	○	○	○	○	○	b.	○
12. Aerobics (at least 3 times each week)	a. ○	○	○	○	○	○	○	b.	○
13. Regular workouts at gym/fitness center (at least 3 times each week)	a. ○	○	○	○	○	○	○	b.	○
14. A mix of fitness activities (at least 3 times each week)	a. ○	○	○	○	○	○	○	b.	○
Lifestyle Changes									
15. Weight loss diet program	a. ○	○	○	○	○	○	○	b.	○
16. Dietary change to improve nutrition	a. ○	○	○	○	○	○	○	b.	○
17. Reduced alcohol consumption	a. ○	○	○	○	○	○	○	b.	○
18. Cut down or stopped smoking	a. ○	○	○	○	○	○	○	b.	○
19. Activities to reduce stress (e.g., relaxation tapes, hobbies, reduced overtime)	a. ○	○	○	○	○	○	○	b.	○

Please review the above wellness activities to insure that you indicated in the bordered column those activities you are still doing.

20. Regardless of your participation in the FAA's Health Awareness Program, which of the following health/wellness promotion activities most appeals to you? **[Please mark ONLY ONE answer]**

- ○ a) Lectures
- ○ b) Videos
- ○ c) Pamphlets/Books
- ○ d) Health Screening
- ○ e) Health Fairs
- ○ f) High Involvement Activities (e.g., exercise, diets)
- ○ g) Hands-on Training (e.g., CPR, self-examination)
- ○ h) Other

FAA HEALTH AWARENESS PROGRAM
CUSTOMER SERVICE ASSESSMENT

21. No wellness program can offer unlimited services, and HAP has tried to offer programs that employees have shown interest in through their participation. **Use this space to provide a brief description of a service you would like to see added to HAP.** *Skip this item if you are satisfied with program offerings.*

22. To what extent are you interested in participating in a WELLNESS MONITORING PROGRAM that would keep track of your progress over a number of months to help you develop a healthier lifestyle?

○ Not At All	○ To a Small Extent	○ To Some Extent	○ To a Great Extent	○ To a Very Great Extent

23. Using the list below, please indicate how you first learned about HAP. **[Please mark ONLY ONE answer]**

- ○ a) DOES NOT APPLY, this is the first I've heard about HAP
- ○ b) From my local FAA **medical representative** (e.g., occupational nurse, flight surgeon, local clinic staff)
- ○ c) From a **Volunteer** Field HAP Representative/Contact
- ○ d) From **CMD** (e.g., Health Risk Assessment, wellness lectures)
- ○ e) From a **pamphlet**
- ○ f) From a **flyer** announcing screening
- ○ g) From a **flyer** announcing lectures/ information/training
- ○ h) From a local agency-sponsored **fitness program/center** referral
- ○ i) In an agency **newsletter** (i.e., Intercom, Regional Newsletter, HOPE, Vitality, etc.)
- ○ j) From a Health Fair
- ○ k) The Employee Assistance Program (**EAP**) referred me
- ○ l) From **coworkers**
- ○ m) From my **supervisor/manager**
- ○ n) From my **safety coordinator**
- ○ o) From a **Video**/HAP Video library
- ○ p) From some **other** source

Yes	No	In the past 12 months, have you...
○	○	**24.** felt more energetic than in past years?
○	○	**25.** been ill less often than in past years?
○	○	**26.** lost weight to come closer to your ideal weight?
○	○	**27.** become more muscular?
○	○	**28.** become more aerobically fit?
○	○	**29.** been exercising more often?
○	○	**30.** started a program to reduce stress?
○	○	**31.** reduced use or dosage of prescribed medication?
○	○	**32.** stayed away from work due to illness less often?

FAA HEALTH AWARENESS PROGRAM
CUSTOMER SERVICE ASSESSMENT

Background information you voluntarily provide is not collected to identify individuals, but to help interpret group results and to target program improvements. This information will be kept *strictly confidential*

33. Please describe your role in your organization. [Please mark ONLY ONE answer]

- ○ Non-manager
- ○ Manager

34. What is your gender?

- ○ Male
- ○ Female

35. How close to your workplace is the nearest FAA medical facility?

- ○ At my facility
- ○ Within 30 minutes drive from my workplace
- ○ Over 30 minutes drive from my workplace

36. How old are you?

- ○ Under 30 years of age
- ○ 30 to 45 years of age
- ○ 46 to 55 years of age
- ○ Over 55 years of age

37. In what region are you located?

- ○ Alaskan (AAL)
- ○ Central (ACE)
- ○ Eastern (AEA)
- ○ Great Lakes (AGL)
- ○ New England (ANE)
- ○ Northwest Mountain (ANM)
- ○ Southern (ASO)
- ○ Southwestern (ASW)
- ○ Western-Pacific (AWP)
- ○ Washington Headquarters (AWA)
- ○ Monroney Aeronautical Center (AMC)
- ○ Hughes Technical Center (ACT)

Yes	No	Health Status:
○	○	**38.** Do you need an airman medical certificate or clearance to perform your FAA job?
○	○	**39.** Have you had a thorough physical examination in the past 18 months?
○	○	**40.** Have you identified a medical condition previously unknown to you as a result of participation in HAP Information Programs?
○	○	**41.** Have you identified a medical condition previously unknown to you as a result of participation in HAP Screening Services?

Thanks for your input!

Look for the results in various FAA newsletters.

Feel free to share comments about FAA's HAP programs on the back of the survey. You are our best source of ideas to help serve you better.