Costs of a work-family intervention: Evidence from the work, family, and health network

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Abstract:

Purpose. To estimate the cost to the workplace of implementing initiatives to reduce work-family conflict. **Design.** Prospective cost analysis conducted alongside a group-randomized multisite controlled experimental study, using a microcosting approach. **Setting.** An information technology firm. **Subjects.** Employees (n = 1004) and managers (n = 141) randomized to the intervention arm. **Intervention.** STAR (Start. Transform. Achieve. Results.) to enhance employees' control over their work time, increase supervisor support for employees to manage work and family responsibilities, and reorient the culture toward results. **Measures.** A taxonomy of activities related to customization, start-up, and implementation was developed. Resource use and unit costs were estimated for each activity, excluding research-related activities. **Analysis.** Economic costing approach (accounting and opportunity costs). Sensitivity analyses on intervention costs. **Results.** The total cost of STAR was $709,654, of which $389,717 was labor costs and $319,937 nonlabor costs (including $313,877 for intervention contract). The cost per employee participation in the intervention was $340 (95% confidence interval: $330–$351); $597 ($561–$634) for managers and $300 ($292–$308) for other employees (2011 prices). **Conclusion.** A detailed activity costing approach allows for more accurate cost estimates and identifies key drivers of cost. The key cost driver was employees' time spent on receiving the intervention. Ignoring this cost, which is usual in studies that cost workplace interventions, would seriously underestimate the cost of a workplace initiative.

Keywords: work-family conflict | workplace intervention | workplace flexibility | supervisor support | cost study | microcosting | financial outcomes | prevention research

Article:

PURPOSE

Work-family conflict (WFC) is defined as a type of conflict where work and family roles are incompatible.[1–3] Several reviews and meta-analyses show that WFC is significantly correlated with higher work stress, turnover intentions, absenteeism, and family stress;[4] lower family, marital, life, and job satisfaction; and lower organizational commitment and productivity.[3–8] As a

result, work-family initiatives to reduce WFC and support employees' lives outside of work have been implemented increasingly in U.S. workplaces.[9,10] However, the vast majority of these initiatives were either not developed on empirically based principles and/or not systematically evaluated, thus their effects on WFC are not well known. There has also been limited discussion of mechanisms by which work-family initiatives are thought to affect business outcomes, including limited attention to work-family conflict as a mediator.[8] What is known, however, is that schedule control and supervisor support, particularly support for work-family issues, are related to lower levels of WFC.[11,12] The intervention implemented in this study utilized these two key ingredients as leverage points for lowering WFC, leading then to increased employee well-being and health and to improvement in organizational outcomes such as increased productivity, reduced absenteeism and reduced turnover.

There is concern that companies might not sustain workplace initiatives if the results do not justify the costs. Similarly, the availability of business case evidence would create support for broader adoption of and employee access to interventions that reduce WFC. However, no study to date has estimated the cost to the workplace of implementing initiatives to reduce WFC. In addition, few studies have used scientifically sound designs, such as longitudinal data collection and appropriate comparison groups, to test the effects of workplace policies and practices on WFC and its correlates.[8]

To address this scientific gap, in 2005, the National Institutes of Health and the Centers for Disease Control and Prevention established the Work, Family, and Health Network (WFHN). The goal of the WFHN is to advance the field of workplace psychosocial interventions designed to reduce WFC in order to improve the health of workers and their families while benefiting employers (http://www.workfamilyhealthnetwork.org).

A review by WFHN researchers suggests that employees' control over work time and supervisors' support for family and personal life are important elements of initiatives to reduce WFC.[8] The WFHN researchers also conducted two groundbreaking pilot studies. In one study, Kelly and Moen[13] investigated the Results Only Work Environment (ROWE) initiative to move employees and supervisors away from time-oriented to results-based measures of work success.[12,14–17] They found that ROWE decreased negative work-to-home spillover and also improved health behaviors.[18] The second pilot study identified specific behaviors associated with family supportive supervisory behaviors (FSSBs), then evaluated a supervisor computer-based training (CBT)[19] and behavioral self-monitoring (BSM) intervention[20] designed to enhance FSSB.[11] The four dimensions of FSSB identified in the pilot study include (1) emotional support for family issues, (2) instrumental support for schedule control, (3) work-family role modeling, and (4) creative work-family solutions. Employees whose supervisors received the family-supportive training had improved reports of physical and mental health, lower turnover intentions, less actual turnover, and better performance appraisals than employees whose supervisors were in the control group.[11,21]

Based upon the review and findings from the pilot studies, the WFHN designed an intervention to enhance employees' control over their work time, increase supervisor support for employees to manage work and family responsibilities, and reorient the culture toward results, eradicating stigma regarding how time is used.[22] The group assessed the efficacy of this intervention via

group randomized field experiments in two organizations representing different industries: an information technology (IT) firm (referred to as ‘‘Tomo’’) and a medium-sized for-profit extended care company (referred to as ‘‘Leef’’).

This paper costs the WFHN intervention, named STAR (Start. Transform. Achieve. Results.), implemented in an IT division of Tomo. It uses the cost methodology that has been applied in prospective cost analysis alongside randomized controlled trials of health interventions.[23] As a standalone cost study, it presents detailed methods that are not current practice in the field of workplace interventions and can be reproduced in future studies. This study will inform future economic evaluations, i.e., studies where both costs and outcomes are evaluated together. Previous economic evaluations of workplace interventions have focused more on the outcomes of the interventions (mainly employee health improvements and employer savings) and have not used rigorous methods for the calculation of costs to the organization. This study aims to change the pattern of back-of-the-envelope cost calculations in studies where costs are an important component. The results of this study will be used in future analyses of the WFHN intervention, such as return-on-investment (ROI) and cost-effectiveness analysis.

METHODS

Design

This study presents a prospective cost analysis conducted alongside a group-randomized multisite controlled experimental study, using a microcosting approach. In the experimental study, a large IT organization in the United States participated in a field experiment. Work groups within the IT division were identified and randomized to the experimental or control group (i.e., workplace intervention vs. usual practice). Data were collected from employees and supervisors at baseline and at 6, 12, and 18 months in order to evaluate the effects of the intervention. Data collectors were blind to the experimental condition of the participants.

In a microcosting approach, each component of resource use is estimated and a unit cost is derived for each.[24,25] We applied the three-step approach used by Zarkin et al.[23] The first step identified the resources used by the intervention, the second measured the amount of resources used, and the third attached a monetary value to those resources. Quantity of resources and dollar values were estimated separately. This allows future employers to apply their own prices and so increases the generalizability of the results to other companies. The costs to employers as a result of employees participating in the intervention were included. This method provides a complete estimation of what it would actually cost a company to implement STAR. The perspective on costs is that of the organization rather than the intervention as implemented in the research study. This perspective increases the value of the cost estimates outside of a research setting, allowing decision makers to use the results in real-world practice.

Sample

Overall, 1004 employees and 141 managers were eligible to participate (i.e., were employed in the IT division of the participating organization and randomized to the intervention condition), and from these 875 employees and 133 managers participated in at least one session. Remote

workers had teleconference access to participatory sessions, with 383 employees and 39 managers attending all sessions remotely and 192 employees and 52 managers attending some sessions remotely and others on-site.

Measures

Identification of Intervention Resources.

First, the study identified the resources used for delivering the intervention. We created a taxonomy of all intervention-related activities containing five categories of activities: development, customization, start-up, implementation, and research. Identification of activities under each category relied upon document reviews and semistructured interviews with the intervention team and intervention coordinators (ICs). The intervention team comprised the facilitators of the participatory sessions and the developers of the BSM and CBT components. ICs were employed by the WFHN to support the rollout and implementation of the intervention. Several activities performed by ICs would be performed by human resources (HR) staff under nonresearch conditions (e.g., delivering CBT and BSM). The participatory sessions were administered by contracted facilitators, and this would also be the case in a real-world setting.

The ultimate goal of this study was to estimate the cost of STAR as it would be delivered in standard practice rather than in a research setting. Therefore, development (e.g., creating BSM software for use on iPods, designing the intervention) and research and evaluation activities (e.g., fidelity monitoring of intervention sessions and focus groups with intervention participants) were not included in the cost estimates, but were identified so they could be separated from customization, start-up, and implementation activities that this paper focuses on. Table 1 presents the taxonomy of activities required for a company to implement STAR.

Table 1. Taxonomy of STAR Activities*

Categories and Activities	Description
Customization	Definition: activities required to adapt each intervention component to the context of the organization's existing policies, regulations, staffing strategies, and financial constraints
Communication with HR and document reviews	Researching the corporate culture and policies of the company to customize the participatory session
Piloting iPods	Piloting iPods with managers with a short HR debriefing for the BSM component
Supervisor support behaviors identification	Identifying supervisor support behaviors through one-on-one meetings and focus groups for the BSM component
Survey of needs	Survey of needs and problems with all employees and managers, based on a 4-item family supportive supervisor behaviors short form[26] for the CBT component
Adaptation of training content Collection of company pictures Video filming	Tailoring of computer training material to the company by using specific terminology, actual examples, company pictures, and an endorsement video by senior management for the CBT component
Start-up activities	Definition: activities required to begin the intervention
Contract negotiations	Contract with Culture Rx, license agreement for CBT, iPod BSM application purchase
Planning/additional communication	Additional communication within company and between company and contractors

Categories and Activities	Description
Scheduling participatory sessions	Scheduling participatory face-to-face training sessions: 6 sessions for managers and 4 sessions for employees
Scheduling CBT and BSM	Scheduling managers CBT and BSM training sessions and related meetings through email or paper and pencil
Preparing CBT and BSM equipment	Computer set up for CBT and iPod set up for BSM
Implementation	Definition: activities performed as part of delivering the intervention
Participatory sessions	Face-to-face participatory training sessions attended by employees and managers. Managers are scheduled for 6 sessions and employees for 4 sessions.
Outside activities	Two sets of activities conducted after two participatory sessions, for a duration of 2 weeks. Managers and employees respond to Web polls.
CBT training	Managers CBT training session
BSM training	Managers BSM tracking in 2 trials, each for 2 wk
Meeting 1	Meeting held for CBT and BSM introduction to managers
Meeting 2	Meeting between ICs and managers for feedback on the first BSM activity
BSM feedback 1	Feedback preparation by ICs for the first BSM trial. Feedback delivered in meeting 2
BSM feedback 2	Feedback preparation by ICs for the second BSM trial. Feedback sent by mail

* STAR indicates Start. Transform. Achieve. Results.; HR, human resources; BSM, behavioral self-monitoring; CBT, computer-based training; and ICs, intervention coordinators.

Measurement of Intervention Resources.

After all relevant activities were identified, data were gathered on the time spent by staff and the space and materials associated with each activity. Costs were separated into labor (e.g., time spent by company staff in intervention-related activities) and nonlabor (e.g., contracted services, materials, and space related to the intervention), because measurement and valuation procedures differ between them.[27,28]

Labor costs were measured by defining the time spent by each person on the activities identified. For all customization and start-up activities, the study used the semistructured interviews to ask staff how much time they spent on each identified activity. Regarding measurement of implementation activities, individual-level attendance for all employees and managers was captured in rosters kept for intervention sessions. For the participatory component, attendance data were matched with records from the ICs and facilitators that contained information on the time spent on each session. Measurement of outside activities involved matching individual-level attendance in two face-to-face sessions with the average time spent on outside activities reported by the intervention team and ICs in semistructured interviews. The CBT and BSM software contained a time-stamping feature that was used to measure the time each individual manager spent using the software. The time spent by managers in the two trial meetings was informed by the semistructured interviews with the intervention team. The time spent by HR in the two trial meetings and BSM feedback preparation was also informed by the semistructured interviews with the intervention team.

Nonlabor costs included space for participatory and CBT sessions and for the two trial meetings, iPod acquisition for the BSM component, purchase of the BSM iPod application, license agreement for CBT, and the contract with the external consultants that facilitated the

participatory sessions. The size of the rooms varied, so space used was measured assuming a standardized space allocation per person by multiplying 15 square feet by the number of people in each session and meeting.[29] The number of iPods purchased used a ratio of one iPod for five managers, allowing implementation to be completed in 12 weeks. The BSM iPod application needs to be purchased only once, allowing the company to deploy it on as many iPods as necessary. The total number of employees and managers receiving the intervention was used to calculate the CBT license fee.

Intervention

The STAR intervention involved 4 months of migration activities. STAR encompassed three components sequenced to build on each other: participatory training sessions, CBT, and BSM. Face-to-face participatory sessions were delivered to employees and managers by external consultants who had developed ROWE at Best Buy. Overall, six sessions were delivered, four for managers and employees (to learn intervention concepts that focus on results and not location and timing of work)[15,30] and two for managers only (to reinforce intervention support and cultural changes). Participatory sessions were linked with two outside activities for all employees to strengthen learning by putting the new concepts into practice. Managers participated in one CBT session, in which they were introduced to supportive behaviors that are known to affect outcomes, such as employee health, absenteeism, turnover, and job satisfaction.[19] CBT incorporated learning in the form of pretests and posttests and intermittent quizzes. Manager BSM was designed by the research team to help managers examine the ways they provided support to their employees.[20] Managers completed two 2-week BSM trials using iPod Touch devices to observe and record supportive behaviors. The trials involved goal setting, daily self-monitoring and tracking of family and performance supportive behaviors, and individual and group feedback. Methods, measures, and study design are described in more detail in the open access report by Bray et al.[31]

Analysis

Valuation of Intervention Resources.

The final step, after identifying and measuring all STAR-related activities, was to collect unit costs to value resource use in monetary terms by multiplying the quantity of resources by their unit cost. Resources were valued using an economic costing approach. This approach includes enumerating both the accounting costs to the employer related to the intervention and the opportunity costs associated with the resources used in the intervention. Accounting costs are the direct cost of the intervention (e.g., the contract cost for the participatory sessions, replacement cost of materials consumed [iPods]). Opportunity costs are the value of a resource in its most highly valued alternative use.[24] Opportunity costs of the ‘‘free’’ resources used to support the intervention included the room space used for intervention sessions and employee, manager, and HR time spent on intervention activities.

Staff time spent on STAR activities was valued with their salaries, collected through computer-assisted personal interviewing and corporate administrative data. HR personnel time was valued with the average HR salary at the company. An hourly rate for each individual was calculated

assuming a 2000-hour work year. This hourly rate was loaded with Tomo's fringe rate of 30%. The labor costs of each activity are the product of the amount of time (hours) spent by each person on the activity and their hourly salary.

Space was valued using the average yearly lease rate in dollars per square foot for a Class A office space, including maintenance fees and utilities from the CB Richard Ellis (http://www.cbre.com/research) MarketView Office ($25.47 per square foot per year for the fourth quarter of 2011). The hourly per-person space cost was calculated by multiplying the hourly price per square foot ($.0029) by 15 square feet. Space costs were calculated by multiplying the hourly per-person cost of space ($.0436) and the number of hours in each session and meeting by individual and summing across individuals. The cost of refurbished 8-GB iPods was valued at the actual purchase price, which was $149 per iPod with full warranty.

The license agreement for CBT included the costs of the editing program used to customize the training ($750) and a license fee of $1000 for 100 trainees (http://www.nweta.com/nweta-titles/). The BSM iPod application was valued at $5. The contract cost a prospective company would have to pay to implement the participatory sessions was used to value the delivery of this intervention com ponent. Based on the actual costs incurred by the WFHN, the contract with the external consultants was valued at $314,000.

Total Cost Estimation.

The total cost of STAR is the sum of the labor, space, contracted services, and materials noted above. These are presented by category and activity in the Results section. The average total cost of STAR per participant is the total cost (sum of the average costs from each category) divided by the number of participants.

The study collected individual-level attendance and time data on the implementation of intervention sessions (face-to-face, BSM, and CBT), which allows reporting of mean costs per participant and a measure of precision: confidence intervals. The mean implementation costs per participant were also broken down by manager and employee because managers were expected to have a greater mean cost per person given the higher number of sessions, participation in the BSM and CBT components, and higher wages. Confidence intervals around individual cost estimates were calculated using bootstrapping to account for the skewed nature of economic data and provide more reliable confidence intervals.[32] We drew 1000 artificial bootstrapped samples, each containing 1008 observations drawn randomly with replacement from the actual sample of 1008 participants.

Sensitivity Analysis.

To ease the transferability of the cost estimates, total labor costs were varied by 20%. This analysis looked at the impact on STAR costs of a variation in labor costs, as salary estimates are industry, company, and setting specific. A second sensitivity analysis varied the contract value of the participatory sessions by 25% to assess the impact on STAR costs when a higher or lower contract cost is negotiated. All analyses were conducted using the statistical package Stata 12.

Table 2. Star Labor Resource Use And Total Cost For Each Activity By Staff*

STAR Activities	Resource Use†						Total Labor Cost, 2011 $‡				
	HR		Manager		Employee						
	No.	h	No.	h	No.	h	Total, h	HR	Manager	Employee	Total
Customization											
Communication with HR and document reviews	1	2	—	—	—	—	2	111	—	—	111
Piloting iPods	1	1.5	3	1.5	—	—	6	83	326	—	410
Supervisor support behaviors identification	1	5	3	1	23	1.00	31	277	218	1351	1845
Survey of needs	1	19	141	1/60	1004	1/60	38	1057	170	983	2210
Adaptation of training content	1	16	—	—	—	—	16	886	—	—	886
Collection of company pictures	1	8	—	—	—	—	8	443	—	—	443
Video filming	1	1	1	4.00	—	—	5	55	458	—	514
Total customization	53		14		40		106	2912	1173	2334	6419
Start-up activities											
Contract negotiations	1	4	—	—	—	—	4	222	—	—	222
Planning/additional communication	1	10	—	—	—	—	10	554	—	—	554
Scheduling participatory sessions	1	156	—	—	—	—	156	8639	—	—	8639
Scheduling CBT and BSM	1	2.17	—	—	—	—	2	120	—	—	120
Preparing CBT and BSM equipment	1	2.38	—	—	—	—	2	132	—	—	132
Total start-up	175		—		—		175	9667	—	—	9667
Implementation											
Participatory sessions§	—	—	133	8	875	5	5515	—	74,507	262,418	336,925
Outside activities	—	—	126	0.38	815	0.35	335	—	3396	16,935	20,331
CBT training§	—	—	102	0.65	—	—	66	—	4682	—	4682
BSM training§	—	—	98	0.38	—	—	37	—	2589	—	2589
Meeting 1	1	4.33	122	0.25	—	—	35	240	2190	—	2453
Meeting 2	1	16.5	66	0.25	—	—	33	914	1179	—	2111
BSM feedback 1	1	49	—	—	—	—	49	2714	—	—	2714
BSM feedback 2	1	33	—	—	—	—	33	1828	—	—	1828
Total implementation	103		1232		4767		6103	5695	88,543	279,353	373,631
Total labor	330		1246		4807		6383	18,274	89,716	281,687	389,717

* STAR indicates Start. Transform. Achieve. Results.; HR, human resources; CBT, computer-based training; and BSM, behavioral self-monitoring. Note: numbers might not add up because of rounding.

† Time (hours) and staff number to complete each activity.

‡ Cost calculated as the quantity of resources multiplied by unit costs. Unit costs were based on average wage per hour by staff type loaded with 30% fringe rate. Average labor cost per hour of $55.38 for HR, $72.55 for managers, $114.57 for senior managers, and $58.73 for employees was used for all activities except participatory, CBT, and BSM sessions.

§ Individual-level data on time for each activity and on individual salary available.

Table 3. Nonlabor Costs Of Star*

STAR Activities	Total Resources	Unit Cost, 2011 $	Cost, 2011 $
Start-up			
Contract for participatory sessions	1008 employees†	311	313,877
License for CBT‡	1 license	1750	1750
BSM iPod application	1 download	5	5
Equipment (iPods)	28 iPods	149	4172
Total nonlabor start-up			319,804
Implementation			
Space participatory session (n = 586§)	2887.76 h	0.0436	126
Space CBT training (n = 102)	66.33 h	0.0436	2.9
Space meeting 1 (n = 122)	81.33 h	0.0436	3.5
Space meeting 2 (n = 66)	24.50 h	0.0436	1.1
Total nonlabor implementation			133

* STAR indicates Start. Transform. Achieve. Results.; CBT, computer-based training; and BSM, behavioral self-monitoring.
† Total number of STAR eligible employees and managers that participated in at least one session.
‡ License for 102 managers attending CBT; unit cost includes customization software.
§From 1008 individuals participating in at least one session, 422 participated only remotely, 244 participated on site for some sessions and remotely for others, and 342 participated on site only (hours adjusted for those participating both remotely and on site).

Table 4. Total Costs Of Star

STAR Activities	Cost, 2011 $
Customization	
Labor	6419
Start-up	
Labor	9667
Nonlabor	319,804
Total start-up	329,471
Implementation	
Labor	373,631
Nonlabor	133
Total start-up	373,765
Total cost of STAR†	
Total labor cost of STAR	389,717
Total nonlabor cost of STAR	319,937
Total cost of STAR	709,654
Total cost of STAR per participant (n = 1008)	704
Mean implementation labor cost per participant‡	
Implementation (CI)	340 (330–351)
Implementation, managers (CI)	597 (561–634)
Implementation, employee (CI)	300 (292–308)

* STAR indicates Start. Transform. Achieve. Results.; CI, confidence interval.
† STAR includes customization, start-up, and implementation.
‡ Includes participatory, computer-based training, and behavioral self-monitoring sessions; bootstrapped 95% CIs calculated.

RESULTS

The costs of the WFHN intervention presented in Tables 2 through 4 are expressed in real 2011 dollars. Table 2 reports estimates of labor resource use (number of staff and hours) and the total labor cost for each activity, by staff involved in the activity. Customization activities took a total of 106 hours, mainly because of the survey of needs in the company and identification of supervisor support behaviors. In terms of start-up, scheduling the sessions took a big part of HR time (156 hours).

Each manager spent an average of 8 hours in the participatory sessions (n = 133), .38 hours in outside activities (n = 126), .65 hours in CBT (n = 102), and .38 hours in BSM (n = 98 for the first trial and n = 66 for the second trial) training. The average time per employee in the participatory sessions was 5 hours (n = 875) and in outside activities was .35 hours (n = 815).

The most expensive labor activity was attending the participatory meetings, with a total cost of $336,925. Total labor costs were $6419 for customization, $9667 for start-up, and $373,631 for implementation activities. The total labor cost of STAR (summing all categories) was $389,717. Breaking down the total labor cost of STAR by staff type gave an estimate of $18,274 for HR, $89,716 for managers, and $281,687 for employees.

Table 3 reports nonlabor resource use, unit cost, and total cost for each nonlabor component. Nonlabor costs were $319,804 and $133 for start-up activities and implementation, respectively. The top part of Table 4 reports the total costs of STAR separated into labor and nonlabor activities for each of the three categories. Implementation was the most expensive category ($373,765) because of the labor costs of the training sessions. This was followed by start-up ($329,471) with costs driven by the contract with the facilitators of the participatory sessions ($313,877; Table 3). The total cost a prospective company with the characteristics of Tomo would have to incur to adopt STAR is $709,654. The total average cost of STAR per participant was $704. This total average cost per participant is a conservative estimate, as not all eligible individuals participated in the intervention and therefore start-up and customization costs might be overestimated. However, we believe this reflects what could happen in a real setting. Overall, time spent in intervention activities was the primary cost driver, followed by the contract cost.

The bottom part of Table 4 shows the mean implementation labor costs per participant, based on individual-level data on salary; number of participatory, BSM, and CBT sessions; and time spent in each session. If a future company decides to adopt STAR the labor cost it would need to incur by participant is $340 ($330–$351), $597 ($561–$634) for managers and $300 ($292–$308) for employees. These estimates evaluate the precision of the mean labor cost related to implementation activities as represented by the bootstrapped confidence intervals. They also provide information on the opportunity cost of employee or manager participation in the workplace intervention instead of their job function. Differences between intervention costs per participant are the result of variations in average wage rates and number of sessions attended by individuals, as reflected in the width of the confidence intervals.

In the first sensitivity analysis, where labor costs were varied by 20%, the total average cost of STAR per participant was between $627 and $781. Varying the contract value of the participatory sessions by 25% resulted in a total average cost of STAR per participant between $626 and $782.

DISCUSSION

This paper presented the methods to cost an intervention designed to reduce employees' WFC and improve well-being and effectiveness in employee work, family, and health outcomes. We used a microcosting approach with data on resource quantities collected alongside an experimental study. A microcosting approach alongside a randomized controlled trial is the preferred design for economic evaluations of health interventions.[33] A prospective design provides timely and higher quality data than a retrospective one. This study advances the field of economic evaluations of workplace interventions, in general, by costing an intervention prospectively in the context of an experimental design, and in particular, by providing the first estimates of the costs of a workplace intervention to reduce WFC. The workplace initiative was disaggregated into various activities, and costs were estimated for each nonresearch activity. A detailed activity costing approach has never been used for costing workplace interventions. Such an approach allows for more accurate cost estimates and identifies key drivers of cost. We found that the key cost driver was employees' time spent on receiving the intervention, followed by the contract cost for the participatory sessions. Ignoring employees' time cost, which is usual practice in workplace intervention cost studies, would seriously underestimate the cost of a workplace initiative. Our results can be translated to other settings outside of a research environment, as resources and prices were presented separately and research costs were excluded. Furthermore, the methodology presented can be used to cost other interventions where opportunity costs are relevant for decisions on adoption and sustainability.

Most workplace studies, when considering intervention costs, have embedded the cost analysis in an ROI and have put very little effort on an accurate estimation of the costs of the intervention. For example, when costing a workplace health intervention, Bertera[34] did not include office space and utilities, equipment, or the value of employee time when attending activities during working hours. Other empirical studies have attempted to estimate ROI for employer-based wellness programs more systematically, but shortcomings in this literature have left the question unresolved.[35] Unlike our study, previous studies have not addressed the costs that an organization incurs to implement these interventions even though they attempted to identify the financial benefits of work-family initiatives. Therefore, we cannot directly compare all our estimates to the costs of other workplace interventions because we include costs that have not previously been considered, such as start-up, customization, space, and employee time, which places a higher hurdle in our estimates. However, to the extent possible, it is still worthwhile to put our results into the context of previous studies. For example, Baicker et al.[36] conducted a meta-analysis of the literature on costs and savings associated with employer-based wellness promotion policies. The majority of the programs focused on weight loss and fitness. A number of industries were represented, and the most frequently used method of delivery was a health risk assessment that served as the initial intervention or requirement for participation in the wellness program. Studies examined programs for 2 to 3 years and the authors spread the costs to annual figures, which might underestimate the actual annual cost of the intervention. For a subset of studies with rigorous control groups, the authors estimated a cost of $274 per employee per year (2009 prices [$287, 2011 prices]), which is not very far from the $340 labor cost per employee participation in the STAR.

This study might have overestimated the costs of the WFHN intervention. Even though an effort was made to disentangle research costs and intervention costs, some of the labor costs related to customization and start-up may be smaller in real practice. Another challenge was that the intervention was developed at the same time it was customized and, despite the creation of a taxonomy of activities, we might not have been able to separate customization from development activities. Nevertheless, the key cost drivers of STAR were related to implementation and contract costs, which were well-defined activities.

The identification and measurement of the time spent in nontraining activities relied on information collected in semistructured interviews. Ideally, despite the increase in data collection burden, the study would have collected individual-level data on the time spent on each of those activities, as was done for the participatory sessions, CBT training, and BSM training.

We presented short-term costs related to implementation of the workplace intervention in one industry for a defined period of time. It can be expected that, in the long run, as the industry learns procedures, part of the start-up and customization costs will be negligible.

Employers' decisions to adopt workplace initiatives, such as the one in this study, are often based upon the outcomes and costs of those practices. Consequently, information on costs and benefits provides evidence on the value of widespread adoption of workplace interventions. The cost analysis presented is a necessary step for ROI, cost-benefit, and cost-effectiveness analyses. These analyses are the next steps in the researchers' agenda, and they will provide further evidence to direct employers on the adoption of the WFHN intervention based on its benefits and costs and to challenge the current organization of work, where family care responsibilities and contemporaneous family structure and functioning are not fully embraced.

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