Review

Transformational Excellence: A Synthesis of Lean and Stress Management Intervention Research with Evidence-Based Actionable Guidelines

Gene Fliedner

Decision and Information Sciences Department, School of Business Administration, Oakland University, United States
E-mail: fliedner@oakland.edu

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Abstract: The philosophy of lean is creating value for the customer through organization-wide continuous improvement, reducing resource consumption (i.e., waste), and improving flow times across value stream processes while maintaining respect for people. Despite numerous studies identifying lean practice contributions to improvements in operating performance metrics, the body of literature devoting attention to the human aspect of lean reveals contradictory effects on the physical and mental health and well-being of employees. Stress management interventions (SMIs) have been shown to offer benefits for physical and mental health well-being. The objectives of this manuscript are to (1) identify the gap in the extant lean literature between the physical and mental health benefits of lean research, (2) review the relevant SMI research, and (3) utilize this review to identify and synthesize evidence-based actionable guidelines that advance transformational excellence with respect for people. These objectives proffer a significant contribution to the existing body of lean knowledge.

Keywords: lean, lean production, lean management, stress management intervention, mental health and well-being, physical health and well-being, job control, job resources, autonomy

1. Introduction

The philosophy of lean is creating value for the customer through organization-wide continuous improvement, reducing resource consumption (i.e., waste), and improving flow times across value stream processes while maintaining respect for people (Fliedner, 2016). Respect for people is pursued through leadership practices, which create an organizational culture relying upon the involvement, empowerment, and development of team members. Organizational culture refers to a set of assumptions that are learned over a long-term time horizon, which serve to guide overt attitudes and practices of a group such as a team (Schein, 1990). An organization’s culture manifests itself in the form of shared elements including company documents, norms of behaviour, beliefs, values, metrics, and rewards. These shared elements are causal determinants of attitudes and practices. Organizational culture refers to these shared elements in a workplace environment (Mann, 2010). Organizational founders and leaders shape the culture.

The respect for people principle has often been credited to the Toyota Production System (TPS). The Toyota Motor Corporation acknowledges the importance of “fostering a corporate culture that enhances individual creativity and teamwork value while honouring mutual trust and respect between labour and management” (Toyota Motor
Corporation, 1992). When mutual trust exists between labour and management, leaders can afford employees autonomy and authority that fosters respect. Leader actions that demonstrate respect for people help to create a culture of mutual respect, which subsequently promotes employee participation and development, encourages teamwork, and leads to enhanced opportunities for systematic improvement.

Lean implementation studies have revealed improvements in performance metrics such as asset base reductions, shortened lead (cycle) times, reduced costs, and enhanced quality (e.g., see Bortolotti et al., 2015; Flynn et al., 1995; Jasti & Kodali, 2015; McKone et al., 2001; Moyano-Fuentes & Sacristán-Díaz, 2012; Shah & Ward, 2003; White et al., 1999; Wood et al., 2004). The more celebrated body of lean literature focuses on the efficacy of lean practices (LP) within the manufacturing sector (Jasti & Kodali, 2015). The lean implementation studies observe shop floor operating performance metric improvements through the application of various “hard” practices such as kanban control, lot size reductions, setup time reductions, total productive maintenance, etc., and investigative tools such as value stream mapping. LP have also demonstrated the ability to achieve similar operating performance metric improvements in service organizations (e.g., see Dobrzykowski et al., 2016; Wood et al., 2004).

While much of the lean literature to date focuses on operating improvements at the shop floor level through the application of “hard” LP, attention to a deeper understanding of the human aspect of lean is emerging through the application of various “soft” practices. This emerging body of work recognizes that human resource management (HRM) or human resource development (HRD) practices (also referred to as supportive infrastructure practices) impact organizational operating performance. These “soft” practices promote a supportive organizational culture with employee investments such as autonomy, job control (a.k.a., job authority, job discretion, or empowerment), small team problem solving, workforce training, and continuous improvement activities. These “soft” practices may also improve organizational operating performance (Bortolotti et al., 2015; Boyer, 1996).

The importance of workers’ commitment to lean productivity improvements has been investigated by multiple authors (e.g., Cusumano, 1994; Gagnon & Michael, 2003; Harrison & Story, 1996; Suzuki, 2004). Leadership commitment that promotes a supportive organizational culture and evidence of “soft” practice investments in employees have demonstrated a positive correlation with favourable job attitudes (Groebner & Merz, 1994). Likewise, welcomed HRM practices have shown an ability to serve as an intrinsic job motivator (de Treville & Antonakis, 2005; Niepce & Molleman, 1996).

In many instances, the lean literature that alleges improvements in operating performance metrics may be partly attributed to practices such as job enlargement, increased workloads and associated responsibilities, greater worker participation (team problem solving and improvement suggestion opportunities), increased autonomy (Forza, 1996; Schuring, 1996), as well as the creation of a learning culture that promotes enhanced collaboration, cooperation, and development opportunities (Bortolotti et al., 2015; Womack et al., 1990). “Soft” practices that enhance behavioural productivity may be as important as the application of shop floor level “hard” practices for the improvement of manufacturing productivity (Emiliani, 1998). Leaders’ use of bundled “soft” HRM practices in conjunction with various “hard” LP have demonstrated that separate and identifiable incremental operational performance metrics are attributable to both (Bortolotti et al., 2015; Shah & Ward, 2003).

Beyond operating performance metric improvements, favourable effects of lean production have also been observed on the mental health and well-being of employees. It was observed that the increase in job variety lean typically entails (Schonberger, 1986) may lead to a decrease in worker stress (Conti et al., 2006). Worker participatory techniques and enhanced autonomy have demonstrated positive effects on employee mental health and well-being (Balzer et al., 2019; Culinane et al., 2017; von Thiele Schwarz et al., 2017; Westgaard & Winkel, 2011).

Despite the numerous “hard” practice studies identifying shop floor operating performance improvements, as well as favourable effects of lean production on the mental health and well-being of employees, the body of “soft” practice literature devoting attention to the human aspect of lean, reveals disturbing unfavourable effects on both the physical and mental health and well-being of employees (e.g., see Spithoven, 2001). Unfavourable physical issues often relate to musculoskeletal disorders (MSD) such as pain and fatigue leading to greater absenteeism and lowered productivity. One review of the literature notes many physical health and well-being studies have been conducted in the auto industry (Koukoulaki, 2014). This review identifies factors contributing to physical disorders including a fast work pace, longer working hours, job enlargement coupled with a lack of skill and competence, repetitious work, and perceived stress, which may lead to physical pain. Furthermore, supervisory monitoring of work-related health effects such as MSD
complaints often obscures their reporting while the teamwork practice in lean environments often discourages injury reporting and taking sick leaves.

Lean production has been characterized as “mean” production due to increased frustration and mental stress attributable to more intense work demands of fast-paced processes and as well as job enlargement (Berggren, 1993, p. 175). Similar to unfavourable physical health effect studies, many of the studies reporting unfavorable mental health and well-being effects have also been witnessed in the auto industry. A first-hand account of the auto industry suggests the heightened workloads of the TPS negatively impact worker safety, mental stress, creativity and innovation, overtime, and morale (Mehri, 2006).

Quality performance improvements through variance reduction attributable to the standardization of work processes have been promoted in the lean literature. Theoretically, greater autonomy can lead to reduced worker stress (Conti et al., 2006). However, lean systems typically reduce decision control (autonomy) and the discretion or freedom for risk-taking given the standardization of work processes and close monitoring to ensure employee adherence (Klein, 1989; Koukoulaki, 2014). Studies have revealed that the level of worker stress increases with both high work demands and a low degree of control workers feel they have throughout the day (e.g., Smith et al., 1995). However, a supportive and well-managed work environment may be good for one’s health as employees who feel they have more control, who feel empowered to make decisions instead of waiting for approval, experience beneficial effects including less stress, anxiety, depression, and absenteeism (Balzer et al., 2019; Bouville & Alis, 2014; Conti et al., 2006; Egan et al., 2007; Great Britain Department of Health, 2004; Marmot et al., 1991; Sprigg & Jackson, 2006; Westgaard & Winkel, 2011). Those only doing as they are told, who are required to follow the rules, seem to be the ones who suffer the most, both mentally and physically.

Furthermore, a decline in the quality of working life subsequent to lean implementations have been observed (Parker, 2003). It has been postulated this may be attributed to the monotonous and repetitious nature of the work (Schouteten & Benders, 2004). The heightened work responsibilities and the capacity of teamwork to exert group pressure to achieve targeted performance metrics in lean systems can be stressful (Schuring, 1996).

Possibly the most important observation given the contradictory reports in the literature cited above regarding the mental health and well-being effects of lean on employees is the conclusion that stress outcomes are heavily dependent on leader choices for designing and operating lean systems (Conti et al., 2006). Twenty LP representing various job demands and job controls and their respective correlations with stress were examined (Karasek & Theorell, 1990). Eleven LP were found to be positively correlated with greater stress. Among these eleven, the stressors of longer working hours, fast work pace/shorter cycle times, a reduced asset base, greater work requirements attributable to an absent operator, and physical ergonomic issues each measured at highly significant levels for heightened stress. Two job support practices which reduce job demands, task support (i.e., providing technical advice and listening to concerns) from both coworkers and supervisors and team working, and one job control practice, worker participation in process improvement, were found to be negatively correlated with greater stress; each measuring at highly significant levels. In a similarly important investigation, job resources (e.g., training, employee participation, and managerial support) were found to be positively correlated with employee engagement and negatively correlated (buffering the effect) of lean system demands on employee health (Huo & Boxall, 2018). These two studies highlight the critical nature of leadership choices possess upon the mental health and well-being of employees (Huo & Boxall, 2018; Karasek & Theorell, 1990).

One account for the total cost of stress to United States organizations resulting from absenteeism is reduced productivity, compensation claims, health insurance, and direct medical expenses exceeding $150 billion annually (Karasek & Theorell, 1990). These authors argue that most serious psychological strain (e.g., fatigue, anxiety, depression, and physical illness) occurs when the psychological job demands are high (e.g., fast-paced work and a wider range of tasks) and the employee’s control (e.g., discretion or autonomy) is low. The National Safety Council estimates that up to one million employee absences per day are stress related while the American Institute of Stress reports that stress is a major factor in up to 80 percent of all worker-related injuries and 40 percent of workplace turnovers (Atkinson, 2004). Another accounting of stress-related illness and injury, including the costs related to stress-related accidents, absenteeism, employee turnover, diminished productivity, and direct medical, legal, and insurance costs, estimates the cost to the United States at more than $300 billion per year (Brondolo et al., 2017). The health of an organization, its culture, and ultimately the physical and mental health and well-being of its most valuable resource, its workforce, is essential if lean systems are to maintain respect for people.
Stress Management Interventions (SMIs) offer the ability to improve the physical and mental health and well-being of employees. SMI research is the area of public health works dedicated to the promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations. It is a field of health care made up of multiple disciplines (e.g., medicine, psychology, epidemiology, physiotherapy and rehabilitation, occupational therapy, occupational medicine, human factors and ergonomics) dedicated to the well-being and safety of employees in the workplace. It has a strong focus on injury prevention and employee education making it relevant for pursuing transformational excellence. To date, possible contributions of stress management intervention research are largely nonexistent in the lean literature.

A “literature review” of scholarly journals as described by Grant and Booth (2009) of relevant SMI and lean research is presented in the following section. This review was conducted through a search of six library databases. Each database selected represents peer-reviewed, scholarly journals. ProQuest One Business and Google Scholar were two of these databases chosen to represent business and education research literature. In addition, the databases of peer-reviewed research literature of PubMed.gov, Cochrane Library, Scopus, and the Web of Science were selected to represent Health Science databases featuring scientific, technical, medical, and social sciences literature disciplines. No publication dates were excluded in order to provide an enhanced chronological viewpoint of the research literature. This review performed was able to incorporate multiple research study types, including quantitative, qualitative, systematic, meta-analysis, and other study types. This review was pursued to identify, synthesize, and offer evidence-based actionable guidelines that promote transformational excellence with respect for people, thereby proffering a significant contribution to the existing body of lean knowledge.

Given a large number of potential manuscripts to assess within the respective databases, the process followed to identify the relevant research was limited to combinations of various terms (keywords) and search limits as prescribed by each respective database. The process followed is respectively identified in Tables 1-6, each of which notes the database, the number of manuscripts identified (returns), the search structure (term(s) or keyword(s) and any database search limits) utilized for the corresponding number of returns. Given a large number of returns for some of the search combinations, additional limits were utilized within each database until a more manageable number of returns were identified. Reading left to right; these increasing search limits are identified within each row of each table until a more manageable number of returns (identified by the *) were found. No intention was pursued to maximize the scope of the review, but rather evidence-based practices were sought. In addition, it is possible that manuscripts outside of the search disciplines may have been inadvertently overlooked. In sum, this literature review scanned the abstract of each of the returned manuscripts in the cells of Tables 1-6 marked with the asterisk to identify its potential to offer a fundamental understanding of SMIs and how the various strategies of SMIs may be implemented to promote respect for people.

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* Abstracts of these returns scanned for review relevancy
SMI = Stress Management Intervention; PR = Peer reviewed; AO = Abstract only; FT = Full text; WFE = Wire feeds excluded

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* Abstracts of these returns scanned for review relevancy
SMI = Stress Management Intervention
2. Relevant stress management intervention research

It is critical for leaders to protect and cultivate both the physical and mental health and well-being of employees in order to successfully pursue transformational excellence and respect for people. It comes as no surprise that medical and psychological studies report physical well-being benefits given the positive connection between one’s mental health and physical well-being. Benefits cited include enhanced immunological tolerance and resistance, greater relaxation, lower blood pressure, sought-after weight loss, higher pain tolerance, improved memory, greater physical resilience, and overall enhanced physical health (see, for example, Brown et al., 2007).

SMIs have been shown to offer benefits for both physical and mental health and well-being. SMIs focus on promoting and maintaining the highest degree of physical, mental and social well-being, as well as the safety of workers in all occupational workplaces.
SMIs have been traditionally categorized as one of three alternative types: (1) organizational-level, also known as primary, (2) individual/organizational-level, also known as secondary, and (3) individual-level interventions, also known as tertiary (DeFrank & Cooper, 1987). SMIs represent an occupational health field of study that crosses medicinal, psychology, epidemiology, physiotherapy and rehabilitation, occupational therapy, occupational medicine, human factors and ergonomic boundaries. Therefore, this review section collates SMI findings from disciplines including human resource/organizational development, organizational behaviour, job stress, occupational safety and health, occupational health psychology, education, and others.

The implementation of alternative SMI types is not always mutually exclusive (Lamontagne et al., 2007; Lehrer et al., 1994). Example SMI strategies often utilize multiple sources of expertise, including internal organization experts (organizational-level), the employees themselves (individual/organizational-level), or external organization experts (individual-level interventions). This manuscript categorizes these interventions as mutually exclusive for clarity and explanatory purposes.

Often times workplace health promotion begins with a consideration of risk factors possessed by individual employees. The key to organizational health promotion is for leaders that “maximize human capital by optimizing the quality of work life within the organization” first through an examination of controllable organizational risk factors prior to an examination of individual risk factors (DeJoy & Wilson, 2003, p. 337). Examples of controllable organizational risk factors include management styles, job demands, work schedules, organizational practices, and opportunities for interpersonal relations.

2.1 Physical health and well-being SMIs

The physical health and well-being of employees are essential for transformational excellence with respect for people. Numerous studies have attempted to quantify the effect of absenteeism on productivity attributable to physical diseases (e.g., hypertension and diabetes) and risk factors (e.g., obesity, smoking, and physical inactivity). One relatively comprehensive study attempting to quantify this effect found that absenteeism estimates ranged from one to two days per year depending upon the chronic disease or risk factor leading to annual absenteeism costs per employee between $16 to $81 for small employers (≤100 employees) and $17 to $286 for large employers (≥1,000 employees) (Asay et al., 2016). This study notes each disease or risk factor was associated with annual national absenteeism costs exceeding $2 billion.

The preservation of the physical human capital or the promotion of enhanced physical health and well-being of employees through wellness programs is explored within the lean research (Fliedner, 2016). Wellness programs are employee-centred intervention programs featuring proactive personal fitness programs, e.g., physical examinations, substance abuse, counselling, and individualized diet and exercise programs. Wellness programs have been effective in improving employee productivity, reducing absenteeism, reducing health care costs, and lowering insurance benefit utilization (Gray, 2011; Ozminkowski et al., 2000). One meta-analysis review of research literature on costs and savings associated with wellness programs found that medical costs fell by about $3.27 for every dollar spent and that absenteeism costs fell by about $2.73 for every dollar spent (Baicker et al., 2010). This meta-analysis review found evidence suggesting that employer-based wellness initiatives may not only improve health, but may also result in substantial savings offering a promising avenue for improving employee physical health, well-being, and productivity. The preponderance of wellness program research literature indicates that leader choices that offer, support, and promote participation opportunities positively impact long-term employee physical health and well-being (Baicker et al., 2010; Goetzel et al., 2002; Gold et al., 2000; Gray, 2011; Heaney & Goetzel, 1997; Merrill, Aldana et al., 2011; Merrill, Anderson et al., 2011; Ozminkowski et al., 2000).

2.2 Mental health and well-being SMIs

The mental health and well-being of employees are also essential for transformational excellence with respect for people. One account for the total cost of employee stress to United States organizations resulting from absenteeism is reduced productivity, compensation claims, health insurance, and direct medical expenses exceeding $150 billion annually (Karasek & Theorell, 1990). These authors argue that most serious psychological strain (e.g., fatigue, anxiety, depression, and physical illness) occurs when the psychological job demands are high (e.g., fast-paced work and a wider
range of tasks) and the employee’s control (e.g., discretion or autonomy) is low. The National Safety Council estimates that up to one million employee absences per day are stress related while the American Institute of Stress reports that stress is a major factor in up to 80 percent of all worker-related injuries and 40 percent of workplace turnovers (Atkinson, 2004). Another accounting of stress-related illness and injury, including the costs related to stress-related accidents, absenteeism, employee turnover, diminished productivity, and direct medical, legal, and insurance costs, estimates the cost to the United States at more than $300 billion per year (Brondolo et al., 2017).

The knowledge, skills and experience possessed by people are significant determinants for the success of any lean system (Drew et al., 2016). Organizational knowledge, or the collective knowledge, skills, and experience of individuals used to create value, is an invaluable asset that pays dividends through innovation, greater productivity, continuous improvement, waste reduction, and flow time improvements across value stream processes. Consequently, the management of mental human capital, namely Knowledge Management (KM), is a strategically vital activity of leaders. Like lean, KM efforts typically focus on organizational objectives such as innovation and continuous improvement through experimentation and sharing of best practices (Gupta & Sharma, 2004). KM promotes organizational learning (Sanchez & Heene, 1997).

Despite the evidence that supports the preservation of the physical human capital through wellness programs, sparse lean research focuses on the preservation of mental human capital, or the mental health and well-being of employees. Employers are willing to address mental health and well-being if they are convinced it is necessary (Taris et al., 2003). There is evidence of its necessity. For instance, several sources cite that one in five Americans, unfortunately, experience emotional issues and mental health illness annually (Bekiempis, 2014; Conley, 2012; National Institute of Mental Health, 2020; U. S. Department of Health and Human Services, 2022). Emotional issues and mental illness manifests as anxiety, stress, chronic pain, absenteeism, burnout, turnover, and even taking human life by suicide. It was estimated that in 2002 in the United States alone, emotional issues and mental illness cost about $300 billion (Conley, 2012). Effective treatment for employees with emotional and mental health problems preserves mental human capital and therefore reduces waste, including lowering total medical costs, lowering absenteeism, and decreasing disability costs, while increasing productivity (U. S. Department of Health and Human Services, 2022).

2.3 Organizational-level SMIs

Organizational-level (primary) interventions focus on policies or procedures for a group of employees such as a department, a team, or the organization as a whole. Primary SMIs typically utilize an organizational change agent (e.g., an organizational expert or the leader) to design and implement the SMI in order to increase the chances for efficacious work reorganization. Because this intervention category focuses on a group, it reflects organizational goals (e.g., productivity, absenteeism, organizational health care costs, critical-to-quality specifications, contract requirements, standards, or regulations) and may not consider the individual person or context. This category consists of proactive preventive strategies. Primary interventions attempt to reduce or remove the sources of stress within the work environment through alterations in physical or psychosocial work environments through organizational changes (Cooper & Cartwright, 1997; Elkin & Rosch, 1990; Lamontagne et al., 2007; Murphy & Sauter, 2003; Richardson & Rothstein, 2008; Taris et al., 2003). Primary intervention strategies are often a means to achieve organizational culture change (Cooper & Cartwright, 1997).

For completeness, organizational-level interventions have also been characterized as top-down, centralized, and one size fits all interventions. This category has also been characterized as “macro-level” interventions, which cut across workplace hierarchies such as the extent of employee participation in decision-making opportunities, and “micro-level” interventions that focus on task structures such as job enrichment, job enlargement, and teamworking (Bambra et al., 2007; Karasek, 1992).

There are numerous examples of organizational-level intervention program strategies. One strategy is job previewing. This strategy attempts to match assessed employee skills with job demands and task requirements which promotes the likelihood of employee success (Adkins et al., 2000; Burns, 1978). This strategy recognizes a need to fit the needs and demands of the job and tasks with the capabilities and skills of the employees. Leader reliance upon a transformative leadership style that positions subordinates based upon their possessed skill sets relative to task demands (e.g., the significance of tasks, variety of skill requirements, and identity of tasks) may enhance employee success (Burns, 1978). Realistic job previews, including positive and negative job aspects, as well as leader communication of
job expectations, reduce performance uncertainty, promote greater job satisfaction, and reduce stress by encouraging reasonable expectations and providing job transition support (Schweiger & Denisi, 1991).

The second grouping of organizational-level intervention program strategies focuses on specific work characteristics, including a leader’s management style (e.g., decision-making participation), work pace, workloads, task significance, skill variety, task identity, and social support (Bunce & West, 1996; Cooper & Cartwright, 1997; DeJoy & Wilson, 2003; Taris et al., 2003; Terry & Jimmieson, 1999). The research literature suggests that a leader’s management style, including the opportunity for employee decision-making participation (sometimes referenced as job control, autonomy, authority or discretion), is an important causal determinant of role strains, which in turn, are important precursors of both individual and organizational outcomes (Bunce & West, 1996; Grover et al., 2017; Jackson, 1983; Karasek, 1979). First-hand experience makes it evident that one’s leadership style and leadership practices can promote employee health and well-being (Mehri, 2006). High levels of worker control promote more effective work, mitigate stress arising from job demands (Grover et al., 2017), and are associated with low levels of stress-related outcomes, including anxiety, psychological distress, burnout, irritability, fatigue, and psychosomatic health complaints (Bambra et al., 2007; Bond & Bunce, 2001; Bunce & West, 1996; Egan et al., 2007; Karasek, 1979; Karasek & Theorell, 1990; Lamontagne et al., 2007; Taris et al., 2003; Terry & Jimmieson, 1999). The implication of greater autonomy is that those with higher levels of decision latitude have a greater opportunity to manage stress as it arises in the work environment.

One specific form of autonomy, Perceived Autonomy Support (PAS), has been explained as a supportive leader that understands and acknowledges a subordinate’s expertise and point of view, provides meaningful information in a non-manipulative manner, offers opportunities for choice, and encourages self-initiation. Research suggests that PAS facilitates skill development (Richer & Vallerand, 1995; Schaubroeck & Merritt, 1997) and is associated with positive work outcomes, attitudes and trust within organizations (Deci et al., 1989). It has been theorized that people have an innate drive to be autonomous, which instils an enhanced work ethic (Pink, 2011). This theory further suggests that once autonomy has been achieved, people obtain the desire to gain mastery over the work, which promotes engagement, energy, and focus. Subsequently, autonomy and mastery promote a valued sense of purpose for the employee. Arguably, work tasks should be designed so employees can enhance their skill mastery and sense of purpose.

Work pace and workloads represent additional work characteristic examples that organizational-level intervention program strategies may focus upon (Copper & Cartwright, 1997). Lean production has been characterized as “mean” production due to increased frustration and mental stress attributable to more intense work demands of fast-paced processes and as well as job enlargement (Berggren, 1993, p. 175). A first-hand account of the auto industry suggests the heightened workloads of the TPS negatively impact worker safety, mental stress, creativity and innovation, overtime, and morale (Mehri, 2006). Serious psychological strain (e.g., fatigue, anxiety, depression, and physical illness) may occur when the psychological job demands are high given fast-paced work and a wide range of task requirements (Karasek & Theorell, 1990). A major source of stress is increased workloads and job responsibilities (Giga et al., 2003). Consequently, redesigning jobs or tasks to modify workplace stressors attributable to work pace and/or workloads represents an organizational-level intervention opportunity.

Another organizational-level intervention program strategy based upon work characteristics is the provision of employee development, namely opportunities for promotion, career and skills development, education, and training. Organizational-level interventions promoting opportunities to enhance skills, both capability and variety, have been shown to enhance innovation and reduce occupational strain (Bunce & West, 1996).

The provision of greater social support is an example of a primary intervention program strategy with a work characteristic specific focus performed at the organizational level (Copper & Cartwright, 1997). Research evidence indicates that social support plays an important role in buffering or moderating the effects of stress on the individual (Carson et al., 1999; Mitchell & Trickett, 1980). Social support leads to improved two-way communication as it encourages greater consultation within groups. Social support may be derived from the opportunity to seek job task guidance from leaders or colleagues, enhanced role clarification due to timelier instructional and performance feedback from leaders, as well as accurate communication and a willingness to listen to employee views by leadership, which has been shown to be a vital component for employee participation and SMI success (Schabracq et al., 2001).

Purposeful listening enables leaders to avoid disinterested and disregarding behaviours while promoting leaders’ ability to meet the current needs of team members. Creating a healthier workplace culture may entail increasing opportunities for superior-subordinate communication and information exchange (DeJoy & Wilson, 2003). As much as
80 percent of information is obtained through listening (Hunsaker, 1990). Purposeful listening is a critical leadership skill which influences organizational culture, trust, respect, job satisfaction, individual creativity, and engagement. Trust in leaders increases the likelihood that employees will fully engage in improvement activities, including discussing and learning from errors as well as questioning assumptions and current practices. A trusted leader amplifies employee engagement (Vogus & Sutcliffe, 2007). The collective knowledge and capabilities of engaged teams used to create value is an investment that pays off in terms of greater productivity and continuous improvement. A positive organizational culture encourages employees to engage and participate in continuous improvement efforts.

Purposeful listening entails pursuing viewpoints from team members’ perspectives while avoiding a focus on one’s self. The greater the attention focused on one’s self, the less chance one has to notice environmental cues preventing improvement opportunities (Herndon, 2008). Purposeful listening also promotes teamwork, as teamwork starts by respecting another’s opinion while attempting to understand another’s point of view.

Regular coworker meetings and support groups are sometimes used as the means to achieve enhanced social support. A coworker support group is a network of colleagues employed in similar roles possessing common needs and goals and charged with solving common problems, affirming each other, and improving skills (Presbury & Cobb, 1985). Coworker support groups promote the development of a supportive employee network offering advice, emotional support, a wider range of skills, and collective problem-solving task knowledge. Coworker support has been identified as an important source of social support in the work environment; it can improve morale and productivity (Kahn et al., 1964). Employee perceptions of co-worker involvement and supervisory support can reduce stress and increase job satisfaction (Babin & Boles, 1996; Cecil & Forman, 1990; Giga et al., 2003).

The establishment of flexible work schedules (e.g., work from home) is a recently deployed organizational-level intervention strategy which warrants a longitudinal investigation of performance results. Technology is enhancing the ability to utilize this approach as it enables work-from-home opportunities. Recent research results suggest that employees who have more control over their work schedule and location generally experience less work-life conflict, greater job satisfaction, and increased productivity (Eng et al., 2010). In addition, the option to partake in flexible scheduling yields a more productive and engaging work environment (Wickramasinghe, 2012). Shortened work weeks and job sharing are possible strategies that may promote compatibility of work schedules with demands and responsibilities outside of the job (Cooper & Cartwright, 1997).

Additional organizational-level intervention strategies exist. The formation of joint labour-management health and safety committees, the establishment of fair employment policies, and organizational-level ergonomic interventions that may advise on posture, lifting, and technological improvements are examples that highlight organizational-level (primary) intervention strategies with a focus on proactive preventive approaches consisting of policies or procedures for a group of employees such as a department, a team, or the organization as a whole. The intention of primary interventions is to reduce or remove the sources of stress within the work environment through alterations in physical or psychosocial work environments through organizational changes (Cooper & Cartwright, 1997; Elkin & Rosch, 1990; Lamontagne et al., 2007; Murphy & Sauter, 2003; Richardson & Rothstein, 2008; Taris et al., 2003).

2.4 Individual/organizational-level SMIs

Individual/organizational-level (secondary) interventions focus on the prompt detection and management of experienced stress by increasing awareness and improving the stress management skills of the individual often through stress reduction training and educational opportunities (Cooper & Cartwright, 1997). Organizational psychologists often view occupational stress as an issue that should be dealt with at both individual and organizational levels (Cecil & Forman, 1990). The principal difference between primary and secondary interventions is the role the individual plays as secondary interventions enable the individual to influence or participate in the intervention design process.

Individual/organizational-level interventions may be customized for the individual (e.g., they may address specific employee mental health, anxiety, depression, etc.) or they may address a group’s objectives. Individual/organizational-level intervention strategies typically use the expertise of the organizational member as well as an organizational change agent (e.g., an organizational expert or the leader) to increase the chances for efficacious work reorganization. Because of the ability to provide individual context as well as the ability to reflect group goals (e.g., the provision being assisted by an expert or professional within the organization), these are often viewed as middle-level driven. Namely, secondary interventions may be dependent upon both the individual as well as group goals.
Secondary interventions focus on reducing the severity of existing stress symptoms before an individual’s health deteriorates further leading to serious physical and mental health issues (Murphy & Sauter, 2003). The role of secondary prevention is one of damage limitation, often addressing consequences rather than sources of stress as the sources inherent in the workplace may not be altered. Secondary interventions often target the individual and attempt to ameliorate this person’s response to stressors in an effort to promote the individual’s ability to cope and manage stress. Consequently, secondary interventions tend to be viewed as reactive in nature.

Employee participation in the design of secondary interventions allows for the inclusion of participant context expertise as well as possible content expertise by the intervention developers (e.g., training and education opportunities). The opportunity for employees to participate in the design is more likely to increase worker control, a sense of fairness, as well as perceived managerial support, all of which are dimensions of stress (Karasek, 2004). Individual participation has demonstrated utility for lowering psychological and physiological signs of stress (Bond & Bunce, 2001; Murphy & Sauter, 2003).

Secondary intervention strategies often focus on stress reduction and education training. Examples of secondary intervention strategies that may be practised or customized by the individual include management’s leadership style, stress management classes and educational opportunities (e.g., cognitive-behavioural skills training and adaptive coping), mindfulness practices, coworker support groups, meditation and exercise skills (e.g., yoga, tai chi, and qigong), relaxation, weight-lifting, deep breathing, journaling, time management and goal setting (Cooper & Cartwright, 1997; Giga et al., 2003; Goyal et al., 2014; Lamontagne et al., 2007; Richardson & Rothstein, 2008; Taris et al., 2003).

Managements’ leadership style offers the ability to recognize the physical and mental health needs of the individual. As noted earlier, the research literature suggests that a leader’s management style (e.g., transformational or participative) is an important causal determinant of role strains, which in turn, is an important precursor of individual outcomes (Jackson, 1983). Transformational leaders work with employees to implement effective change. Transformational leadership has four components: (1) idealized influence, (2) intellectual stimulation, (3) inspirational motivation to enhance confidence, and (4) individualized consideration (Bass, 1990; Burns, 1978).

Idealized influence reflects the respect for people principle which has often been credited to the TPS. Idealized influence is earned when leaders model ethical behaviour. This affords leaders a necessary level of employee respect and trust which promotes leadership influence. When mutual trust exists between labour and management, leaders can afford employees autonomy and authority which fosters respect. Leader actions that demonstrate respect for people help to create a culture of mutual respect which subsequently promotes employee participation and development, encourages teamwork, and leads to enhanced opportunities for systematic improvement.

Transformational leaders understand the need for an environment that seeks continuous improvement. A culture of mutual respect advances intellectual stimulation which encourages challenging of assumptions, soliciting alternative points of view, risk-taking, and subsequently experimentation. Intellectual stimulation leads to improvement opportunities.

Inspirational motivation is achieved through a leader’s communication skills to articulate a vision understood and shared by team members. The provision of job control subsequently promotes employees’ desire to gain mastery over the work furthering engagement, energy, and focus. Autonomy and mastery promote a valued sense of purpose for the employee. Inspired motivation is created with a strong sense of purpose (Pink, 2011).

Transformational leaders provide individualized consideration and empathetic resource support by listening to employees’ unique concerns and needs. Transformational leaders adapt their management styles to accommodate individual team members. Transformational leaders position team members by attempting to match assessed employee skills with job demands and task requirements which promotes the likelihood of employee success (Adkins et al., 2000; Burns, 1978). This leadership style acknowledges a need to fit the needs and demands of the job and tasks with the capabilities and skills of the employees. Leader reliance upon a transformational leadership style that positions subordinates based upon their possessed skill sets relative to task demands (e.g., the significance of tasks, variety of skill requirements, and identity of tasks) may enhance employee success (Burns, 1978).

A participative leadership style (Lewin et al., 1939) affords individual decision-making participation (job control, autonomy, authority or discretion). Leaders may promote lower levels of stress-related outcomes, including anxiety, psychological distress, burnout, irritability, fatigue, and psychosomatic health complaints with a greater level of worker job control (Bambra et al., 2007; Egan et al., 2007; Karasek, 1979; Karasek & Theorell, 1990; Lamontagne et al., 2007;
Taris et al., 2003; Terry & Jimmieson, 1999). One particularly noteworthy secondary intervention study for stress reduction promoted increasing job control by the employees for whom the organizational change affected. The study results indicated significantly improved mental health, sickness absence rates, and self-rated performance at a 1-year follow-up (Bond & Bunce, 2001).

Stress management training classes and educational opportunities (e.g., cognitive-behavioural skills training or adaptive coping) provide a means for individuals and organizations to detect, manage, and improve stress management skills. This subcategory of secondary intervention strategies promotes better self-awareness activities and skills training, which may enhance one’s physical and psychological resources for perceived stress. Training and educational opportunities can afford individual context as well as the ability to reflect group goals. These opportunities are sometimes provided by video technology or through organizational experts. Cognitive-behavioural skills training, or adaptive coping, is one example. Cognitive-behavioural interventions promote the development of both proactive and reactive responses to stress (Richardson & Rothstein, 2008). Cognitive-behavioural interventions were found to provide improvements in general psychological strain and job satisfaction (Bunce & West, 1996) and were more effective than relaxation or multimodal (passive and active coping skills) intervention strategies (Van der Klink et al., 2001).

Mindfulness has garnered increasing empirical attention in recent years for its ability to positively impact work performance, relationships, and employee physical and mental health and well-being (Brown et al., 2007; Wells, 2016). Mindfulness has demonstrated the ability to reduce stress, promote positive work attitudes, improve self-regulation, enhance job satisfaction, and improve job performance as well as employee engagement (Dane & Brummel, 2014; Eby et al., 2019; Ergas, 2013; Harrington & Dunne, 2015; Leroy et al., 2013). Mindfulness has also been shown to reduce cognitive failures attributable to memory lapses and distractions (Herndon, 2008).

The recent research literature reveals two emerging bodies of Mindfulness: one of which focuses on the intrapsychic processes of the individual, or Individual Mindfulness (IM), and the other on the social processes of groups, or Collective Mindfulness (CM) (Sutcliffe et al., 2016). Each of these emerging bodies of Mindfulness is comprised of various intervention practices. These bodies of research literature reveal that both IM and CM practices are more of a social construct. IM is shaped by both leader practices and enacted through bottom-up processes of social relationships, actions, and interactions of the individual. Namely, IM is an example of a secondary intervention strategy. CM is created through top-down organizational processes that influence social relationships and interactions.

Greater social support is an example of an intervention program strategy with a work characteristic specific focus that may also be adopted at the individual level. A coworker support group is a network of colleagues employed in similar roles possessing common needs and goals and charged with solving common problems, affirming each other, and improving skills (Presbury & Cobb, 1985). Coworker support groups promote the development of a supportive employee network offering advice, emotional support, a wider range of skills, and collective problem-solving task knowledge for one another. Research on the use of coworker support groups suggests that employee perceptions of coworker involvement and supervisory support can reduce stress and increase job satisfaction (Babin & Boles, 1996; Cecil & Forman, 1990; Giga et al., 2003).

Various stress reduction and education skills training such as meditation and exercise (e.g., yoga, tai chi, qigong), relaxation techniques, weight-lifting, deep breathing, journaling, assertiveness training, as well as time management and goal setting are additional examples of secondary interventions strategies that may be practised and customized by the individual (Cooper & Cartwright, 1997; Giga et al., 2003; Lamontagne et al., 2007; Richardson & Rothstein, 2008; Taris et al., 2003). The secondary intervention stress reduction and educational skills training opportunity strategies are often highly customized to the individual reflecting differences such as one’s personality, coping skills, age, gender, attitudes, as well as past experiences. Consequently, a more detailed explanation of the various secondary intervention stress reduction and educational skills training opportunities practised by the individual is beyond the scope of this review.

It should be acknowledged again that several of the individual/organizational-level intervention strategy examples provided here have counterpart organizational-level strategy examples. SMI research identifies that some interventions cannot be neatly classified as one particular intervention type as they might address a combination of individual and organizational objectives. It should also be noted that secondary intervention strategies offered by organizational leadership require an investment of organizational resources such as professional expertise and a location for individual practice as well as the provision of opportunity (i.e., time).
2.5 Individual SMIs

Individual (tertiary) interventions focus on remedial support for the individual. Individual-oriented techniques or tertiary interventions have demonstrated utility for lowering psychological and physiological signs of stress (Murphy & Sauter, 2003). Tertiary interventions are designed to treat the individual employee’s diagnosed health condition after the fact often through free and confidential access to qualified mental health professionals. The assumption of tertiary interventions is that mental health benefits will carry over into the workplace. Examples of individual-level intervention strategies include counselling, treatment, rehabilitation, and recovery often from in-house counsellors or outside agencies such as employee assistance programs (EAPs). This category of interventions is beyond the scope of this project because no explicit connection is made between the intervention and the work environment. Nevertheless, the following relevant observations have been offered by the research literature (Arthur, 2000): (1) employee reliance upon EAPs may offer employee stress symptom reductions; (2) individuals value the organizational provision of the service; and, (3) organizations do not necessarily achieve benefits of improved employee productivity, morale, performance and a general reduction in organizational stress.

The research literature examples cited in the paragraphs above identify those leader choices regarding the transformation system and job design impact both employee physical health and well-being as well as employee mental health and well-being.

2.6 Recent SMI research directions

Secondary SMIs have received greater emphasis in the recent research literature, in part to their recognition of both individual and organizational contextual information. The growing emphasis on individual’s mental health as well as a better understanding of strategies such as stress management classes and educational opportunities (e.g., cognitive-behavioural skills training and adaptive coping), mindfulness practices, meditation and exercise skills (e.g., yoga, tai chi, and qigong), relaxation, and deep breathing, which can focus on the needs of the individual, has spurred a greater focus on secondary SMIs.

The preponderance of the recent research of SMI research has focused on assessing numerous secondary SMI strategies within smaller, specialized stakeholder groups for resilience empowerment and stress prevention. For instance, recent investigations and systematic literature reviews of SMI strategies have focused on the nurse population (see e.g., Chesak et al., 2019; Delaney et al., 2016; Hersch et al., 2016; Velana & Rinkenauer, 2021), law enforcement (see e.g., Liakopoulou et al., 2020; Nwokeoma et al., 2019; Patterson et al., 2014), military personnel (see e.g., Harden et al., 2021; Pallavicini et al., 2016), mining and oil and gas extraction (see e.g., Asare et al., 2021), cancer patients (see e.g., Buneviciene et al., 2021; Chang et al., 2021; Rush & Sharma, 2017), and student populations (see e.g., Kumar & Suresh, 2022), among other specialized groups. Members of these groups have traditionally been recognized as higher-risk stakeholders.

In addition to these numerous specialized studies, recent years have also witnessed advanced technologies, in particular web-based virtual interventions, being utilized to offer SMIs. Recent research investigations have been conducted to test the effectiveness of virtual reality-based SMI offerings (e.g., see Boß et al., 2021; Eklund et al., 2021; Nixon et al., 2021). This research has identified critical drivers for the provision of web-based SMIs, including the ability to: (1) reach an unlimited number of participants, (2) protect the physical welfare of participants (due in large part to coronavirus disease 2019), (3) facilitate greater remote participation, (4) easily scale offering size, and (5) meet increasingly digital lifestyle desires. The preponderance of the research evidence suggests virtual technology has the capability to be as successful as face-to-face formats for providing mental health benefits. However, drawbacks of web-based SMIs have been noted, including (1) low adherence and higher dropout rates compared with face-to-face and self-help formats, and (2) high resource (coach) time demands per participant.

3. Implications, lessons learned, and actionable guidelines

The objectives of transformational excellence include creating value for the customer through organization-wide continuous improvement while reducing resource consumption (i.e., waste) and improving flow times across value
stream processes. These objectives must also include maintaining respect for people as the single most important asset within transformation processes is human capital. The review of the lean and SMI research offers implications, lessons learned, and the identification and synthesis of numerous noteworthy evidence-based actionable guidelines for transformational excellence practices directed towards maintaining respect for people. It is essential to recognize that the physical and mental health and well-being of employees are heavily dependent on leader choices for designing and operating lean systems (Conti et al., 2006). These actionable guidelines promote the physical and mental health and well-being of human capital as well as resilience-building among employees.

Although lacking a uniform scale for any construct, SMIs have been measured by various metrics. These metrics include employee stress, anxiety, depression, job/work satisfaction, and general mental health measured at the individual level. Regardless of the metric, the preponderance of the SMI research literature demonstrates that primary and secondary interventions have achieved beneficial employee physical and mental health and well-being results (e.g., see Adkins et al., 2000; Arthur, 2000; Babin & Boles, 1996; Bambra et al., 2007; Bond & Bunce, 2001; Bunce & West, 1996; Cooper & Cartwright, 1997; DeFrank & Cooper, 1987; Egan et al., 2007; Elkin & Rosch, 1990; Giga et al., 2003; Jackson, 1983; Karasek, 1992, 2004; Lamontagne et al., 2007; Murphy & Sauter, 2003; Nielsen et al., 2010; Richardson & Rothstein, 2008; Taris et al., 2003; Terry & Jimmieson, 1999; Van der Klink et al., 2001).

Beneficial results of SMIs prescribe leaders create a supportive organizational culture that promotes physical and mental health and well-being and resilience among employees. The foundation for employee physical and mental health and well-being must be created in a proactive fashion, demonstrating a commitment to maximizing employee potential. Research evidence unambiguously demonstrates that a combination of primary and secondary intervention strategies has the ability to develop a supportive culture that promotes and protects the physical and mental health and well-being of human capital within the entire organization. This is also of great importance to society as a whole given the expected increasing reliance upon global value streams.

A critical element for positive physical and mental health and well-being outcomes lies in the relationship that develops between leaders and individuals. Beneficial results identified in SMI research strongly suggest this relationship must enhance individual creativity through individual involvement, empowerment, development, and teamwork values achieved through critical leadership skills and practices. The primary and secondary SMI research advocates enhanced job control (e.g., autonomy, authority, discretion, and decision-making participation) as well as greater job resources (e.g., training, opportunities for decision-making participation, and managerial support such as providing technical advice and listening to concerns), both of which make significant differences in employee abilities to rise to the challenge of lean system problem-solving demands (Huo & Boxall, 2018). The direction of these relationships upon employee physical and mental health is depicted in Figure 1.

![Figure 1](image)

**Figure 1.** Effects attributable to the provision of greater job control and job resources

Using the lean and SMI research literature, the following three propositions, each of which is congruent with Figure 1, are offered:
Proposition 1: Leader reliance upon transformational and/or participative leadership styles will help to promote enhanced employee physical and mental health.

Proposition 2: A firm characterized by a greater reliance upon LP and tools, which promote greater employee job control, will achieve enhanced employee physical and mental health.

Proposition 3: A firm characterized by a greater reliance upon LP and tools, which promote greater employee job resources, will achieve enhanced employee physical and mental health.

It is reasonable to postulate that the SMI research identifying beneficial employee physical and mental health results relies upon strategies and tactics that may be furnished by reliance upon an underlying transformational and/or participative leadership style(s) of Proposition 1. These two styles of leadership have been shown to be effective leadership styles for employees’ physical and mental health and well-being (e.g., see Bass, 1990; Burns, 1978; Lewin et al., 1939). It is leaders that can create a culture of respect for people in part through the provision of employee empowerment and involvement.

A transformational style of leadership (Burns, 1978) focuses on the relationship and connections formed between leaders and subordinates. This leadership style compels leaders to motivate and inspire followers by creating an awareness of the task’s importance, articulating task and job expectations, encouraging followers to focus on team and organization goals rather than self-interests, and mentoring and assisting subordinate development. Transformational leaders invest in employee skills, education and training. Transformational leaders preview employee skills with task requirements and job demands, recognizing a need to fit the needs and demands of the tasks and job with the capabilities and skills of the employees thereby promoting the likelihood of employee success (Adkins et al., 2000; Burns, 1978). Transformational leaders challenge workers with greater autonomy and authority to make decisions once they have been trained to acquire the necessary skills. Benefits cited for this style include enhanced commitment, involvement, loyalty, relationship trust, and worker performance (Bass, 1990; Burns, 1978).

Participative or democratic leaders make the final decisions, but offer guidance to group members and include team members in the decision-making process by soliciting their input (Lewin et al., 1939). Participation allows for the inclusion of context expertise. A participative style of leadership engages subordinates, recognizing their individual knowledge and expertise, and soliciting their opinions, but recognizing the decision-making authority rests with the leader. Numerous benefits of a participative leadership style have been cited, including greater employee job satisfaction, productivity, morale, teamwork, motivation, relationship trust, increased readiness to accept change, improved decision quality, and enhanced individuals’ managerial development (e.g., see Lewin et al., 1939). The downside of democratic leadership is the potential for longer decision-making times (Amanchukwu et al., 2015; Lewin et al., 1939).

These two leadership styles suggest a process which emphasizes presence, empathy, and purposeful listening in the relationship with employees. The active attempt to draw upon the individual’s knowledge and expertise encourages team member creativity and innovation through engagement. Subsequent employee engagement furthers mutual trust and respect which affords leaders the opportunity to provide employees with job autonomy and decision-making authority. This process of leadership actions that demonstrate respect for people helps create an organizational culture of mutual respect. This desired culture promotes employee participation and development, encourages teamwork, and leads to enhanced opportunities for systematic improvement. This is the environment that promotes positive physical and mental health and well-being outcomes for individuals and teams.

It is not unreasonable to assume that transformational and participative leadership styles can be the underpinning requirement for a healthy organisational culture that demonstrates respect for people. Although it is unlikely to be an exhaustive list, the preponderance of the evidence in the primary- and secondary-level SMI research literature on employee physical and mental health and well-being benefits previously cited frequently identify five noteworthy strategies which promote enhanced job control and greater job resources and lead to improved employee physical and mental health:

i. Job previewing to match assessed employee skills with job demands and task requirements;

ii. The provision of increased employee job control through increased autonomy, authority or decision-making discretion;

iii. Decreased job demands with options such as employees being granted input for work standards, work pace, or workloads; cross-training for increased assignment distributions; ergonomic improvement; etc;

iv. Career skills development, education, and training opportunities such as job enlargement, job enrichment, and cooperation, have shown to offer the possibility of a positively significant impact on workplace performance (Kuipers et al., 2004);

v. Increased managerial and co-worker social support.
It is these five strategies which lead to the identification of actionable guidelines utilizing a basket of LP and tools, each of which is based upon either job control-based or job resource-based strategies. These LP and tools solicit input from team members as well as contextual information. These practices and tools utilize these five strategies recognized by the primary and secondary SMI research as promoting beneficial employee health effects of SMIs. Namely, these practices and tools offer the opportunity for greater employee problem-solving input, job autonomy, authority, discretion, training, skills development, and enhanced social support promoting the use of engaged employees’ skills, knowledge, ideas, and creativity, all of which can promote the positive employee health effects identified in Figure 1, Proposition 2, and Proposition 3. These practices and tools create continuous improvement opportunities which enable improved organizational operating performance (Bortolotti et al., 2015).

These actionable guidelines should not be limited solely to times when issues arise. Rather, leaders should pursue these actions on a continuing basis. These actionable guidelines promote activities that challenge employee engagement. Activities that allow employees a voice with an aim for improving company performance through empowerment, those challenge employees, and which provide learning experiences demonstrate respect for people (Liker & Franz, 2011; Mann, 2010; Pakdil & Leonard, 2015).

- Solicit preferences (job previewing) for job and task assignment distributions from employees in an attempt to promote greater job control with a better match between employee skills and job demands and task requirements. Although the eventual assignment decision rests with leaders, this opportunity enables employees to identify and articulate opportunities and their preferences for skills development. This guideline promotes the likelihood of employee success, reduces performance uncertainty, promotes greater job satisfaction, and reduces stress by encouraging reasonable expectations (Adkins et al., 2000; Burns, 1978; Schweiger & Denisi, 1991).

- Utilize Nemawashi: An historical explanation and review of the Nemawashi process are offered by Fetters (1995). This consensus-seeking decision-making process has been described as a creative, semi-formal, systematic, and sequential process of preparing the foundation for a proposed change. The objective of the Nemawashi process is to facilitate interaction among stakeholders, including soliciting ideas, allowing for critical questions, and providing an opportunity for stakeholder input (discussion, debate, and feedback) thereby promoting greater job control and job resources. Consensus and approval of a proposed idea are sought from every stakeholder prior to decision-making. Social support enhances the Nemawashi process as the likelihood of its success depends upon one’s ability to understand the circumstances, feelings and thoughts of stakeholders as well as one’s ability to convey an enthusiastic willingness to help others as much as possible in return for their assistance.

- Create an Obeya: a large room used for planning purposes to facilitate communications (Aasland & Blankenburg, 2012). The concept originated out of the Global 21st Century (G21) project at Toyota to design and develop the Prius. Its use represents a collaborative environment where all technical design and development functions are represented which may address the impact siloed work has on slowing development processes. The Obeya serves to equalize the influence of functional disciplines, which may promote greater development efficiencies thereby promoting greater job control and job resources. Although finding a mutually convenient time for a shared decision-making group to meet and then for the dynamics of the group often takes more decision-making time (Amanchukwu et al., 2015; Lewin et al., 1939). However, when all relevant group members have access to the same information, the collaborative environment may actually reduce the time to achieve consensus decisions as well as rework iterations.

- Use Kaizen events: a small-step work improvement approach representing a focused activity of a team-related issue typically within a particular transformation process or task. This practice typically utilizes the knowledge and expertise of individuals and a team of employees working in a related area of a transformation process over a short span of time to generate ideas, identify and quickly remove waste, and pursue opportunities for improvement based on the team’s unique context, both knowledge and experience. This promotes greater job control and job resources. One review of case studies of successful Kaizen events focused on measuring the outcomes (both technical performance and human resource outcomes) and identifying design and context factors related to their effectiveness, both in terms of generating positive initial results and sustaining event
outcomes over time. This review cites an increasing number of companies that are using Kaizen events to promote substantial improvement in key technical performance metrics and organizational member learning (Farris et al., 2008).

A systematic literature review of 195 Kaizen event articles identified the critical nature of numerous Kaizen event characteristics (Glover et al., 2014). Among these characteristics, team member authority/autonomy and having a well-defined problem scope were identified as key aspects of Kaizen event success and sustainability.

- Use Kaikaku events: a large-scale work improvement approach seeking radical work improvement focused on a transformation process or an entire business. It may seek to introduce new knowledge, strategies, skills, processes, methods, or equipment. This practice recognizes the need to be agile and flexible given increasingly rapid technological change and competitive actions within industries. Kaikaku events typically utilize the knowledge and expertise of individuals and a team of employees working in a transformation system to generate ideas, identify and remove waste, and pursue opportunities for improvement based on the team’s unique context. This promotes greater job control and job resources. One case study review of a Kaikaku event identified the project led to a 67 percent increase in productivity for the focused area (Gåsvaer & von Axelson, 2012). This same study offered two caveats of interest: (1) the need to possess kaizen (continuous improvement) mentality prior to conducting a Kaikaku event, and (2) the observation that a kaizen culture may restrain a Kaikaku event since having a mindset of incremental innovation may restrain the radical innovation capability.

- Adopt and maintain quality circle (QC) usage: an ongoing decentralization of management responsibility for improving productivity and quality typically by direct involvement of individuals comprising a small team of employees doing related work utilizing the knowledge and expertise and customized based upon the team’s unique context (Zetie, 2002). Decentralization creates empowerment and freedom (Pakdil & Leonard, 2015), which in turn, promotes greater job control and job resources. Additionally, in one review of this employee involvement mechanism, it is noted when QCs are “compatible with management philosophy, employee attitudes, the work setting, and organizational culture, QCs offer potential benefits through modest incremental improvements in productivity, quality, and quality of work life values” (Miller, 1989, p. 7).

- Adopt and maintain suggestion programs: active solicitation of employee suggestions coupled with positive reinforcement and timely feedback encourage continued employee engagement, which promotes greater job control and job resources. Suggestion programs also require the design of appropriate and timely reward mechanisms. One review of employee involvement suggestion programs notes that reported empirical benefits resulting from employee involvement in these programs fall into two major categories: cognitive benefits, which are positive outcomes pertaining directly to productivity; and affective benefits, which include increased morale, increased job satisfaction, and reduced grievances, disciplinary actions, turnover, and absenteeism (Kim, 2005). The cited principal argument for employee involvement in enhancing information flows and knowledge applications is sometimes referred to as the “cognitive model of participative effects” (Miller & Monge, 1986, p. 730). However, as noted in the review, suggestion programs can have significant implementation costs. Therefore, in order to make a suggestion program successful, the review concludes that leaders must attempt to maximize the cognitive potentials of employees by fully cultivating and using their knowledge and ideas through employee education and training (Kim, 2005).

- Encourage regular Hansei: a practice that encourages an individual’s self-reflection with the intent to generate insight into one’s self through the identification of variation between expectations and results, acknowledging variation and possibly one’s mistake without blame, and identifying opportunities for future improvement. It acknowledges there is often an opportunity for improvement when a team member can reflect honestly upon outcomes with modesty and humility. The desired outcome is the identification of plans that ensure one’s mistake will not occur again. It has been observed, that “without Hansei, it is impossible to have Kaizen” as “Hansei and Kaizen go hand in hand” (Liker, 2004, p. 257).

- Offer education and training opportunities: skills development and subsequent promotion opportunities have been shown to enhance creativity and innovation (Bunce & West, 1996). Employee education and
training opportunities promote one’s job resources.

- Encourage the frequent and regular use of numerous creativity, continuous improvement, and investigative tools, including but not limited to A3 templates, brainstorming, Delphi techniques, focus groups, team huddles and team debriefs, process mapping, Pareto analysis, cause-and-effect diagrams, check sheets, scatter diagrams, control charts, acceptance plans, and others. Each typically utilizes a small group of people designed to generate a large number of ideas for improving productivity, and quality, and reducing member social inhibitions. Evidence suggests these tools also offer the potential benefit to boost morale, enhance work enjoyment, improve teamwork, and providing social support. A manuscript identifying benefits associated with the use of lean continuous improvement and investigative tools in the drug discovery and development industry concludes that “deep, root-cause exploration of problems creates a rich and constructive stimulus for new ideas,” lean thinking “puts powerful tools in the hands of the staff who are closest to the problems and can create the autonomy and flexibility for them to tackle them,” and lean thinking “creates a more involved, engaged and committed workforce who take pride in their achievements, thus driving self-confidence and further cycles of ideation and innovation” (Johnstone et al., 2011, p. 54). The autonomy, flexibility, creativity, and engagement of these tools require support to enhance job control and job resources.

These actionable guidelines will promote the relationship between the leader and team members that ultimately will reinforce an organizational culture demonstrating respect for people through the reliance upon team member involvement, empowerment, development, creativity, and teamwork values. Leader reliance upon “soft” practices promotes a supportive culture and employee investments (e.g., delegation, autonomy, authority, small group problem solving, employee training and development, and continuous improvement activities), which can also improve organizational operating performance (Bortolotti et al., 2015). Leader actions that demonstrate respect for people help to create a culture of mutual respect. A focus on processes without a comparable focus on people has been cited as one of the reasons that lean implementations fail (Pakdil & Leonard, 2015). This desired culture subsequently promotes employee participation and development, encourages teamwork, and leads to enhanced opportunities for systematic improvement. This is the environment that promotes positive physical and mental health and well-being outcomes for individuals and teams. Member engagement and empowerment over work processes have demonstrated positive employee physical and mental health and well-being (Balzer et al., 2019; Cullinane et al., 2017; von Thiele Schwarz et al., 2017; Westgaard & Winkel, 2011).

4. Study limitations

SMI research provides clear evidence for the efficacy of job-control and job-resource-based aspects of both primary and secondary SMIs (e.g., see Adkins et al., 2000; Arthur, 2000; Babin & Boles, 1996; Bambrä et al., 2007; Bond & Bunce, 2001; Bunce & West, 1996; Cooper & Cartwright, 1997; DeFrank & Cooper, 1987; Egan et al., 2007; Elkin & Rosch, 1990; Giga et al., 2003; Jackson, 1983; Karasek, 1992, 2004; Lamontagne et al., 2007; Murphy & Sauter, 2003; Nielsen et al., 2010; Richardson & Rothstein, 2008; Taris et al., 2003; Terry & Jimmieson, 1999; Van der Klink et al., 2001). However, the benefits relative to the costs associated with the provision of SMIs will always be uncertain at best.

Costs associated with stress resulting in absenteeism, reduced productivity, worker-related injuries, compensation claims, health insurance, and direct medical expenses are relatively easily captured. Costs associated with the provision of SMIs may also be easily captured. Examples of costs would include reliance upon internal or external SMI experts, location/space costs, and delivery costs (e.g., time and virtual technology). The benefits of primary SMIs may be measured at the organizational level by metrics such as employee absenteeism, productivity, and turnover. The efficacy of secondary-level SMIs can also be measured via metrics associated with individuals’ anxiety, depression, burnout, irritability, psychosomatic health complaints, or other concerns. However, because the metrics of secondary-level SMIs are person-specific and subjective, the creation of a cost-benefit ratio of secondary-level SMIs is challenging at best, making a determination of the benefits relative to the costs uncertain.

An SMI offering often requires either internal or external expertise. There will often be a concern as to whether an organization possesses or can find the appropriate expert(s) to deliver the desired organizational-level or individual/organizational-level SMI. Technology has enabled the identification and delivery of various remote secondary-level SMIs (e.g., meditation, exercise, relaxation, weight-lifting, deep breathing, journaling, and others), but a primary
organizational-level SMI often requires the use of an internal organizational expert.

A leader’s and team members’ possession of appropriate conflict management skills represents an additional concern regarding the application of several of the suggested LP and tools. Several of these practices and tools (e.g., Kaizen and Kaikaku events, QCs, and numerous investigative tools), require collaboration and consensus agreement on cause-and-effect findings and remedies. There will be times when team members may be unwilling or unable to achieve a consensus agreement. Conflicts can slow processes and even prevent desired solutions from being identified and implemented. Therefore, a premium is placed upon a leader’s and team members’ abilities to understand and utilize effective conflict resolution approaches such as collaborative problem-solving. Conflicts can become exacerbated in virtual environments given a lack of physical proximity, direct supervision, shared experiences, and social trust. A willingness to find a consensus with effective communication requires a great deal of effort and skill on behalf of all team members.

5. Conclusions

This manuscript focuses on lean, SMI, and the identification of actionable guidelines that are designed to promote employee physical and mental health and well-being. To date, SMI research offerings are largely nonexistent in the lean literature. SMI research deserves attention in the lean literature given its ability to positively impact work performance, organizational relationships, and employee physical and mental health and well-being. Like lean, SMI research conclusions can create value for the customer through organization-wide continuous improvement, respect for people, reduced resource consumption (i.e., waste) and improved flow times across value stream processes.

SMI research suggests that interventions cannot be neatly classified as one particular intervention type as they might address a combination of organizational and individual objectives. The preponderance of the SMI research literature demonstrates that most organizational interventions rely upon a combination of intervention strategies, particularly primary-level and secondary-level strategies (Lamontagne et al., 2007; Lehrer et al., 1994; Taris et al., 2003). In addition, one study suggests that secondary- and tertiary-level interventions will likely be insufficient in maintaining employee health without a complementary primary intervention approach (Cooper & Cartwright, 1997). SMI research suggests that organizational reliance upon interventions should be pursued aggressively through multiple strategies. The identified actionable guidelines support a combination of organizational and individual objectives.

The participation of those most affected in both the SMI design and implementation is critical. SMI results indicate that participation opportunities, for example, an individual’s provision of job control and pursuit of a form of exercise, is an essential determinant of intervention results. Participation by those directly involved in the intervention is more likely to increase worker control, a sense of fairness, as well as perceived managerial support, all of which are dimensions of stress (Karasek, 2004). SMI participation significantly improves people’s mental health, sickness absence rates, and self-rated performance (Bambra et al., 2007; Bond & Bunce, 2001; Bunce & West, 1996; Egan et al., 2007; Jackson, 1983; Karasek, 1979; Karasek & Theorell, 1990; Lamontagne et al., 2007; Pink, 2011; Taris et al., 2003; Terry & Jimmieson, 1999).

The conclusions of this manuscript are open to potential bias as the literature reviewed strongly supports collaborative team efforts pursuing autonomy and participatory decision processes. The validity of the statistical and anecdotal findings of the reviewed literature is not questioned here. Rather, it is used to offer suggestions for actionable guidelines, which support the mental and physical health and well-being of employees. Numerous studies cited in this manuscript have revealed that greater employee control (autonomy) and participation offer the potential for improving employee physical and mental health and well-being (e.g., Egan et al., 2007). Performance metric improvements achieved through standardized processes are important. Nevertheless, leaders must find means to enhance customized individual engagement and promote team and employee autonomy while still maintaining standardized processes. Engagement and well-being can be improved when employees have their basic needs met, have the opportunity to participate, see value in their contributions, are provided with a sense of belonging, and are afforded development opportunities (Harter et al., 2004).

Last, the identified actionable guidelines require leadership commitment. This commitment will likely require the provision of expert assistance to design and conduct SMI implementations. This commitment will also likely require the provision of time to practice as well as the space necessary for practice.
The objective of these actionable guidelines is simple: maintain respect for people, as the single most important asset within transformation processes, is human capital. Leadership commitment that promotes a supportive organizational culture with evidence of soft practice investments can act as a catalyst for systematic improvement, impact job attitudes in a positive manner, serve as intrinsic motivation, and enhance employee physical and mental health and well-being. The health of an organization and ultimately the physical and mental health and well-being of its most valuable resource, its workforce, is essential if lean systems are to maintain respect for people.

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Conflict of interest statement

There is no conflict of interest for this study.

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