

IN-DEPTH REVIEW

The health and well-being of remote and mobile workers

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Background	Remote and mobile workers (RMWs), people who spend the majority of work time away from a home or office base, are estimated to number 1 million in the UK and Ireland. A number of advantages and challenges have been identified with this way of working but little is known about the impact of this type of work on the health and well-being of RMWs.
Aims	To identify any potential health or psychosocial effects associated with remote and mobile working, identify ergonomic factors that impact on this group and ascertain the effect of organizational or management factors that influence this occupational group.
Methods	A systematic review methodology was used and a search strategy developed including keywords, which were used to search electronic databases and websites. Data were then extracted from included papers and quality assessed.
Results	Initial searches identified 280 references but only 11 papers reached the inclusion criteria. Health effects identified included musculoskeletal symptoms associated with higher mileage and more time in a vehicle but a number of vehicle design issues were found to improve symptoms. Psychosocial factors including high demands were also found but better mental health was associated with higher mileage and more time with clients. There was a lack of substantive evidence in relation to managing this group.
Conclusions	There is little research currently available on the general health of RMWs and future research should examine this further and focus on general health and access to support services.
Key words	Ergonomics; occupational health; occupational mental health; remote and mobile working.

Introduction

Remote and mobile workers (RMWs) are individuals who spend the majority of their working time away from a home or work base; they have also been described as nomadic or mobile teleworkers, multilocal e-workers and dispersed technical workers [1–4]. In terms of this review, RMWs were defined by the research team as individuals who have <4 h face-to-face contact with their managers or colleagues per week. Examples of this type of work include sales representatives, repair engineers, installation engineers and delivery drivers, where there is usually a link between the individual and the workplace via telephone and/or computer.

Thirteen per cent of businesses surveyed within the EMERGENCE Europe study were using multilocal e-workers with an estimated 1 000 000 workers with this definition in the UK and Ireland [5]. Across the European Union-15, it was estimated that the number of multilocal e-workers will increase to 14 332 000 through

employment growth and organizational change by 2010 [5]. Individuals included in this group were involved in customer service work, sales, software development, human resources, management or training [5]. This sector has grown from 520 000 employees in 1997 to 910 000 employees in 2001. However, due to the lack of a recognized definition within the research, for example, home workers being included in the title teleworkers, accurate figures are not obtainable. However, caution must be taken with these data as they are sampled from businesses consisting of >50 employees, and e-workers are defined as those who have a telecommunications link to deliver their work. It is unclear from the research methodology whether all remote and isolated workers would be considered within the multilocal teleworkers definition.

In terms of managing RMWs, a number of advantages and challenges have been identified by Kurland and Bailey [4] and are presented in Table 1. From this descriptive research, there are both positive and negative issues suggested in the management of remote workers including

Table 1. Advantages and challenges for RMW

Organizational level		Individual level	
Advantages	Challenges	Advantages	Challenges
Greater productivity Lower absenteeism	Performance monitoring Performance measurement Managerial control Synergy Informal interaction Organization culture Virtual culture	More autonomy Schedule flexibility Absence of office politics	Social isolation Professional isolation Organization culture Reduced office influence Longer hours Access to resources Technical savvy
Customer proximity	Organization loyalty Availability Schedule maintenance Work coordination Communication Guidelines Technology		

Kurland and Bailey [4].

increased productivity as well as the challenges of performance monitoring and managerial control. At the individual employee level, research suggests positive factors such as autonomy and flexible timing but highlighted possible challenges such as isolation and being away from the office environment. This descriptive work does raise a number of issues but is unable to identify if the advantages and challenges actually exist.

Little is known about the impact (either positive or negative) of remote working on health and well-being. This systematic review of the evidence aimed to evaluate health and well-being among this occupational group by addressing the following questions.

1. What health effects are associated with remote and mobile working?
2. What psychosocial effects are associated with remote and mobile isolated working?
3. What ergonomic factors affect those involved in working in a mobile and remote environment?
4. What organizational/management factors have been identified as influencing remote and isolated workers?

Methods

Initial scoping work into RMW identified little published research in this field. However, it was appreciated by the researchers that the search terms in this field were likely to be diverse and from a number of different research fields. To develop the systematic review, the methodology of the Centre for Research and Dissemination at York University [6] was used. The review aimed to identify health and psychosocial factors associated with remote and mobile working including possible ergonomic, organizational

and management factors that may affect this occupational group. Keywords, search terms and inclusion/exclusion criteria were developed and key electronic databases and websites were searched for studies published from 1980 onwards. The search strategy is presented in Table 2. Searches were carried out within Medline, Web of Knowledge (which includes the Science Citation Index and the Social Science Citation Index), Ergonomics Abstracts, Psychinfo, SIGLE, COPAC and BLPC. Government literature was also reviewed from the Health & Safety Executive, the European Agency for Health and Safety and National Institute for Occupational Safety and Health.

Papers were identified and managed using Reference Manager (v 11) and an initial screening of abstracts was carried out. Where relevant full publications were obtained and compared to inclusion and exclusion criteria and a decision made on their relevance to the review. Data were then extracted and a quality assessment was made based on the criteria below (Box 1). The methodology, originally developed by the Royal College of General Practitioners, has been successfully used in other reviews of back pain, hand arm vibration and musculoskeletal disorders [7–9].

Results

An initial search identified 280 references. After screening, the reviewers agreed that 139 abstracts fulfilled the inclusion criteria and full documents were obtained for review. Each document was reviewed and a large number were rejected, mainly due to the inconsistent use of terms such as teleworkers relating to home workers rather than RMWs. In total, 11 papers were included in the systematic evidence review.

Table 2. Search strategy for review

Types of work	Psychosocial factors
Lone work/er/ing	Quality of life
Remote work/er/ing	Psychological well-being
Isolated work/er/ing	Stress
Mobile work/er/ing	Job satisfaction
Rural	Social support
Rural work/er/ing	Social isolation
Sole working	Job demands
Solitary work/ing/er	Role conflict
Telework/er/ing	Decision latitude
Nomadic telework	Autonomy
Mobile telework	Time pressure
Dispersed technical workforces	Target hitting
Delivery drivers	Relationships with co-workers
Service technicians	Role ambiguity
Sales representatives	Role conflict
Peripatetic work/er	
Multilocal e-workers	
Ergonomic factors	Health outcomes
Vehicle	Ill health
Driving	Illness
Vehicle as office	Musculoskeletal discomfort
Mobile office	Musculoskeletal pain
Pervasive computers—SAT NAV, active	Stress/strain
Traffic management	Voice disorders—vocal load
Monotony	
Conditions of employment	
Personal isolation	
Job performance	
Population	
Employed individuals working >30 h/week who spend <4 h/week at an office or home base or in face-to-face contact with managers or other staff	
Study design	
RCTs	
Quasi-experimental	
Observational	
Cross-sectional	
Case reports	
Qualitative research	
Outcome	
All outcomes to be assessed in relation to the studies obtained based on population, interventions and study design	

The health effects studied focused on musculoskeletal symptoms. Table 3 presents the evidence tables (note that an abbreviated version of Table 3 is published here and the full version is available online as Supplementary data at *Occupational Medicine Online*). The most frequent

Box 1. Rating

- *** Strong evidence provided by consistent findings in multiple high-quality scientific studies.
- ** Moderate evidence provided by generally consistent findings in fewer smaller or lower quality scientific studies.
- * Limited or contradictory evidence produced by one scientific study or inconsistent findings from multiple studies.
- No scientific evidence.

injury sites reported were the neck, shoulders and lower back [11–14] (***). Within this occupational group, the prevalence rate of low back pain was 25% for men and 35% for women [11,12] (***). A number of significant associations were identified within the research including associations between neck symptoms and being female (OR = 2.76, 95% CI 1.72–4.43), driving >15 000 km per annum (OR = 1.48, 95% CI 1.01–2.99) and carrying out sedentary work for more than a quarter of work time (OR = 2.68, 95% CI 1.31–5.49) [13] (**).

There was a greater prevalence of shoulder pain noted in females (OR = 1.77, 95% CI 1.20–2.62), being in the car for >10 h/week (OR = 1.64, 95% CI 1.19–2.27) and being a smoker or ex-smoker (OR = 1.46, 95% CI 1.08–1.96) [13] (**).

Driving and vehicle design issues were linked to lower back symptoms including driving >20 h/week (OR = 2.00, 95% CI 1.30–3.10), driving >15 000 km per annum (OR = 2.23, 95% CI 1.29–3.85), having an uncomfortable seat (OR = 2.1, 95% CI 1.60–2.9) and carrying loads in and out of the vehicle (OR = 1.3, 95% CI 1.00–1.70) [11,13]. There was a suggestion of an increased risk of lower back symptoms with increasing age (OR = 1.94, 95% CI 1.10–1.90), driving >20 h/week, tobacco consumption (OR = 1.4, 95% CI 1.10–1.70), being an ex-smoker (OR = 1.51, 95% CI 1.09–2.10) and psychological factors (OR = 1.7, 95% CI 1.30–2.20) [11,13].

Two papers were identified that examined work factors and mental health. Borg and Kristensen [15] (**) found, through regression analysis of 1306 sales people, that poor mental health was significantly associated with high demands ($P < 0.001$), low decision authority ($P < 0.05$), low skill discretion ($P < 0.001$), role conflict ($P < 0.001$), job insecurity ($P < 0.001$), unclear roles ($P < 0.001$) and role conflicts ($P < 0.01$). Conversely, better mental health was associated with the number of hours per customer ($P < 0.01$) and a higher number of kilometres driven ($P < 0.01$) [15].

Table 3. Evidence table for health effects associated with remote and mobile working

Study	Study design and methods	Population	Outcomes	Rating
Harris <i>et al.</i> [10]	Review article. Review of occupational health risks associated with peripatetic work	Peripatetic sales staff	Long distance driving linked to an increase in risk of road traffic accidents Access to occupational health and rehabilitation may be a problem Must develop policies to deal with violence and personal safety issues	*
Pietri <i>et al.</i> [11]	Cross-sectional and longitudinal. Reviewed during annual medical examination and interviewed. Follow-up was 12 months later. Data included in the regression analysis was sociodemographic, lifestyle, work environment and psychological survey questions	Commercial drivers spending more than half their time visiting clients. <i>N</i> = 1709 at first interview T ₀ and 1115 at second interview T ₁ . Men, <i>N</i> = 1376. Mean age 38.7 years (SD 9.5). Women, <i>N</i> = 343. Mean age 37.6 years (SD 9.4)	25% prevalence rate of low back pain at T ₀ for men and 35% for women. At T ₁ , the cumulative incidence of low back pain was 13% for men and 17% for women. This was associated with between 10 and 20 h driving per week, having an uncomfortable car seat and reporting 3/4 psychological factors.	***
Sang <i>et al.</i> [12]	Cross-sectional. On-line questionnaire survey. Tools included the NMQ, the GHQ-12 and assessment of organizational and work tasks.	Pharmaceutical sales representatives <i>N</i> = 205 who drove >15 000 work miles per annum <i>n</i> = 140 with a response rate of 68%. Men = 70. Women = 69	84% of participants reported a musculoskeletal symptom over the last 12 months; lower back 57%, neck 46%, shoulders 45% and hips thighs or buttocks 32%. Average mileage was 22 000 miles with 20 h per week spent in the vehicle. Psychological distress was reported by 14% of respondents.	**
Skov <i>et al.</i> [13]	Cross-sectional questionnaire survey. Questionnaire survey using the NMQ	Salespeople, <i>N</i> = 1998. Response rate, 1306, 66% Men, <i>N</i> = 1167 Mean age 42 years (SD 9.9). Women, <i>N</i> = 137. Mean age 36.5 years (SD 7.8)	Prevalence of symptoms in the last 12 months. Men: neck 54%, shoulders 35% and low back 63%. Women: neck 76%, shoulders 47% and low back 64%. Musculoskeletal symptoms were significantly associated with high mileage, sedentary work and being a current or ex-smoker.	**
Porter and Gyi [14]	Structured interview of drivers and passengers. NMQ as a structured interview	<i>N</i> = 600, 303 men, 297 women. Non-drivers, <i>N</i> = 135. Social, domestic and pleasure drivers, <i>N</i> = 309. Drive as part of the job, <i>N</i> = 113	Discomfort reported in at least one body area by 54% of driving sample and most frequent areas of discomfort were the low back (26%) and the neck (8%). Positive correlations found between absence and high mileage, hours driving and smoking.	**

NMQ, Nordic Musculoskeletal Questionnaire.

Skov *et al.* [13] (***) identified, from the same data, that a number of musculoskeletal symptoms were linked with psychosocial factors. These included neck symptoms being associated with higher work demands (OR = 1.43, 95% CI 0.99–2.06), low control over time (OR = 1.44, 95% CI 1.07–1.93), low variation in work (OR = 1.82, 95% CI 1.23–2.69) and high levels of perceived

competition (OR = 1.44, 95% CI 1.08–1.91). In the same study, shoulder symptoms were found to be associated with high work demands (OR = 1.47, 95% CI 1.05–2.07) and high levels of uncertainty over employment (OR = 1.76, 95% CI 1.26–2.46), while back symptoms were associated with lower levels of interaction with colleagues (OR = 1.48, 95% CI 1.03–2.14) and a

Table 4. Evidence for psychosocial effects of RMW

Study	Study design and methods	Population	Outcomes	Rating
Borg and Kristensen [15]	Cross-sectional questionnaire survey. Questionnaire survey using Mental Health scale of the SF-36, and psychosocial environment assessed by the measure based on Karasek's model and the Whitehall II study	Salespeople, $N = 1998$. Response rate, 1306, 66%. Men, $N = 1167$. Mean age 42 years (SD 9.9). Women, $N = 137$. Mean age 36.5 years (SD 7.8)	Poor mental health is associated with longer working hours per week, more customers per month, high psychological demands, low decision authority, conflicts, job insecurity, unclear roles and role conflicts. Better mental health was associated with more time with customers and a high level of mileage.	**
Harris <i>et al.</i> [10]	Review article. Review of occupational health risks associated with peripatetic work	Peripatetic sales staff	Isolation and frustration due to lack of communication/human interaction identified as a potential risk factor	*
Skov <i>et al.</i> [13]	Cross-sectional questionnaire survey. Questionnaire survey using the Nordic Musculoskeletal Questionnaire and psychosocial factors assessed by survey using Karasek's model and the Whitehall II study	Salespeople, $N = 1998$. Response rate, 1306, 66%. Men, $N = 1167$. Mean age 42 years (SD 9.9). Women, $N = 137$. Mean age 36.5 years (SD 7.8)	Musculoskeletal symptoms were associated with high work demands, lack of control over time, low variation in work, high levels of uncertainty, and lower levels of interaction with colleagues or a perception of feeling overworked. Recommends job re-design to achieve more time spent in the workplace.	**

tendency to feel overworked (OR = 1.45, 95% CI 1.06–1.98).

The potential risks from isolation and frustration due to the lack of communication or human interaction were identified as a potential issue for this occupational group. No evidence was provided as to the extent of this [10] (*) (Table 4; note that an abbreviated version of this table is published here and the full version is available online as Supplementary data at *Occupational Medicine* Online).

A number of ergonomic factors were identified within the design of vehicles and cars, including the use of lumbar supports and steering wheel adjustment. When examining the types of problems found by those who use the car as an office, Eost and Flyte [16] (**) found that most people worked in the driving seat and that lack of temperature control in the vehicle, cramped conditions and physical pain from working in the car were the main issues raised. Harris *et al.* [10] (*) identified that fixed postures due to driving were linked to pain in the lower back, neck and upper limbs. Porter and Gyi [14] (**) surveyed 600 drivers who drove as part of their work, using the Nordic Musculoskeletal Questionnaire. The analysis identified that those drivers with an

adjustable lumbar support reported significantly fewer absences due to back pain ($P < 0.05$) and those with adjustable steering wheels reported significantly less shoulder pain ($P < 0.05$) than those without. Further ergonomic factors identified within this sample were a lack of headroom in vehicles, poor pedal position, no backrest angle adjustment and poor steering wheel positioning [14] (Table 5).

From the material reviewed, a number of issues in relation to organizational and managerial factors were identified; however, much of the research is either of moderate or limited quality. The potential problems identified included isolation away from the main workplace, communication being difficult and managers requiring training to manage peripatetic workers and develop trust [4,10,17] (*). However, there was no further research available to either refute or corroborate this.

Although there is a perception that remote and mobile work can offer more flexibility, this is only where the job allows. For example, employees in mobile service engineering work have limited flexibility on when and where they work [3] (*). One study comparing mobile teleworkers and office-based workers identified that there

Table 5. Evidence for ergonomic effects on RMW

Study	Study design and methods	Population	Outcomes	Rating
Eost and Flyte [16]	Cross-sectional observational. Interview, case studies and diaries	Individuals who carried out office work in their cars, $N = 90$, 87 males, 3 females	Participants spent 4 h/day driving, ½ to 1 h/day doing paperwork. 95% did office work from the driver's seat and items such as clipboards, Dictaphones, participants used laptops. The main issues raised by participants were: a lack of temperature control in the car (especially when stationary and working); cramped conditions; lack of time; physical pain caused by working in the car; lack of storage space; poor mobile phone reception	**
Harris <i>et al.</i> [10]	Review paper. Review of literature	Peripatetic sales people	Review raised issues of fixed postures when driving linked to low back, neck and upper extremity pain. Ergonomic issues identified included musculoskeletal problems with the lower back, neck and upper extremities; heavy lifting out of vehicles also raised as a risk factor. Ergonomic problems related to long hours driving	*
Porter and Gyi [14]	Structured interview of drivers and passengers. Nordic Musculoskeletal Questionnaire as a structured interview	$N = 600$, 303 men, 297 women. Non-drivers, $N = 135$. Social, domestic and pleasure drivers, $N = 309$. Drive as part of the job, $N = 113$	Of the driving group, those with an adjustable lumbar support reported fewer absences from back pain (0.3 ± 0.8 versus 0.7 ± 2.4 days $P \leq 0.05$), having or not having steering wheel adjustment and shoulder pain (0.3 ± 3.4 versus 0.02 ± 0.2 $P \leq 0.05$). Drivers reported problems such as not enough headroom (7%), poor pedal position (10%), poor steering wheel position (5%) and no backrest angle adjustment (9%). This group reported significantly higher discomfort with their car. 12% of small car drivers compared with 3% of large family car drivers reported neck troubles in the past 12 months. However, 12% of both small and family car drivers reported having low back pain interfering with normal activity in the past 12 months	**

were no significant differences in the hours worked between the two groups. The majority of mobile workers were positive about their work, timing of work and flexibility in work location. There was a divide in those

that were able to balance work and life and those that reported being unable to do this [18] (**), where those with pre-school children were more positive about having time for family life and work-life balance [18]

Table 6. Evidence for social and managerial factors affecting RMW

Study	Study design and methods	Population	Outcomes	Rating
Harris <i>et al.</i> [10]	Review paper. Review of literature	Peripatetic sales people	Identifies that due to workers being remote from the office it is both difficult to identify and solve problems within this workforce. Recommended personal safety training as part of general training.	*
Hill <i>et al.</i> [18]	Cross-sectional computer-based questionnaire survey. Computer-based survey tool, not validated. Used 3-point and 5-point Likert scales to evaluate responses	Mobile teleworkers, marketing and servicing employees, $N = 399$. Response rate, $N = 249$, response rate 62% versus office workers, $N = 89$	No significant difference found in hours worked. Significantly increased flexibility in the location and timing of work. 72% of mobile teleworkers were positive about the personal benefits of this way of working, 60% positive about the flexibility of location and 50% positive about the influence on work-life balance.	**
Helms and Raiszadeh [17]	Descriptive paper. N/A	Discusses virtual offices including remote working	Suggests managers need further training to supervise such workers. Communication not as good in the virtual environment. Trust vital when managing teams. New processes will be developed with the introduction of new technology. Suggests if customers unhappy managers will hear about it and vice versa	-
Jacobs [3]	Observational study, qualitative interviews and focus groups. Qualitative interviews and focus groups	Mobile Service Engineers (MSEs), $N = 60$ Service managers, $N = 15$	MSEs exposed to the challenges of telework but also the additional challenges of no choice when or where they work, the working environment is public and supervision is tight. Recommends the development of unscheduled communication between management and engineers and engineers and engineers	*
Kurland and Bailey [4]	Descriptive paper. N/A	Discusses teleworking and mobile working.	Identifies the issues regarding remote working including work away from home, increased travel, difficulty balancing work and home life	*

(Table 6; note that an abbreviated version of this table is published here and the full version is published online as Supplementary data at *Occupational Medicine* Online).

Discussion

The systematic review of the evidence identified that there was a dearth of higher quality research on RMWs. Much

of the health data concentrated on musculoskeletal problems and although psychosocial hazards were identified, this was linked with musculoskeletal research.

The review identified lower back pain as a potential issue in this occupational group, moderate evidence of musculoskeletal symptoms of the neck and shoulders with symptoms associated with being in a vehicle >10 h/week, driving >20 h/week and higher mileage. With regard to mental well-being, moderate evidence was found for poorer mental well-being in those working longer hours

and having high psychological demands, low levels of control and unclear roles. Furthermore, better mental well-being was associated with more time with customers and higher mileage. Musculoskeletal symptoms were also found to be related to psychosocial symptoms including high work demands, low control over time, job insecurity, lack of interaction with colleagues and feeling overworked. In relation to vehicle ergonomics, moderate evidence was identified with vehicle design issues relating to musculoskeletal problems. A number of factors, such as lack of space and poor temperature control, were also identified as issues when using the car as an office. Some of the managerial issues identified included moderate evidence that the number of hours worked was no different between mobile workers and office-based workers, contradictory evidence on flexibility of when and where working and some positive benefits with regard to work-life balance were also identified. At the current time, there is a lack of substantive evidence on how best to manage this group.

Although it is appreciated that the definition used within the EMERGENCE study is restrictive and based upon information being passed using a telecommunications link, RMW work (such as travelling sales representatives or service engineers) has been present for many decades.

The evidence in relation to health focused on musculoskeletal symptoms and a number of associations were identified between symptoms, work factors and lifestyle factors. However, no further evidence with regard to any other potential health outcomes was addressed by the research. This indicates an evidence gap in the area. Furthermore, the reporting of musculoskeletal symptoms suggests that vehicle design issues still need to be addressed in addition to the duration of either driving or sitting in vehicles. The fixed postures adopted when driving for longer periods are likely to contribute to musculoskeletal discomfort. Thus, having adjustability within vehicle design (including lumbar supports and steering wheel adjustment) as well as the knowledge of how to adjust a vehicle and to take rest breaks when driving are essential.

Only one paper was found that investigated the impact of carrying out office work in vehicles [16]. The issues highlighted included the difficulties in actually trying to carry out office work in the car. Although this research suggested a number of design solutions, there is no further evidence to show that the design changes suggested have been taken on board by those involved in RMW. Within RMW, there is a need to identify how and what technology is being used and if this has a positive or negative impact on musculoskeletal or other health symptoms. There is also a need to measure accurately how much time is spent working within vehicles and whether this has an impact on symptoms or whether symptoms are related to other work tasks.

One further risk factor identified was that of handling bulky materials in and out of vehicles being linked to lower back pain. However, there was no further research identified, which examined whether risk assessment, choice of vehicle design and manual handling training could reduce the incidence of such problems. This lack of information highlights a further data gap.

In relation to mental well-being, two papers identified links between psychosocial factors and workplace factors. What was surprising was that higher mileage and more time with customers was associated with better mental health, although higher mileage was associated with increased musculoskeletal symptoms. This perhaps indicates that individuals who have more time with clients experience reduced pressure, thereby mediating some of the psychosocial effects. The association between poor mental health and psychosocial factors such as demands, decision authority, control and role conflict could potentially be related to isolation from work colleagues and supervisors. This would be in the sense of not having the usual office support mechanisms in place. Further research is required to investigate this including the direction and strength of relationships.

A number of associations were also found with musculoskeletal symptoms and psychosocial factors. This agrees with other research with regard to the impact of psychosocial factors and musculoskeletal symptoms found in other working groups [19–21].

The review also suggested that access to support services such as occupational health or rehabilitation may be difficult for RMW. No further research was available to support this and further investigation is required to identify if this is an issue for RMW. With changes in technology, there is the opportunity to maintain contact with remote workers to identify health or other problems and identify routes to resolve them. However, changes in technology can also change the way people work in not switching off the technology so could potentially have a negative impact.

Within the review, five papers were identified that researched organizational and social factors in relation to RMW. Again, the quality of the evidence ranged from limited to moderate evidence and in one case, no evidence. However, managing RMWs does raise a number of issues and evidence gaps. With regard to working hours, one study found no difference between hours worked by office workers and mobile workers. The claims for a more flexible working time were not evident within the research as this depends on the working group. For example, service engineers are under strict supervision and have no choice in where to work, whereas other staff groups may not be so restricted.

Some positive benefits of remote working were also identified in that mobile teleworkers had increased flexibility in the location and timing of work compared with office workers. In addition, those with pre-school children were

significantly more positive about the impact of this type of work and work-life balance issues. Thus, depending on the type of work being carried out, there is the opportunity to increase flexibility and autonomy within the workforce.

There were two further issues raised from the body of research reviewed. Firstly that where problems do arise within a mobile workforce, it may be difficult to identify them and implement possible solutions due to the lack of face-to-face communication within the workforce. The second issue raised was with regard to the management of individuals working in a mobile and remote environment. There was no evidence to support the statement but it may be a correct perception that line managers will need to undergo further training when supervising this type of work. As a result of technology changes and the increase in ability to work remotely, this will require a different approach and more trust and worker autonomy than when supervising workers in more traditional closely-knit working environments.

Although there is a perception that remote and mobile working will allow benefits in terms of flexibility and autonomy, this is countered by questions with regard to isolation and fixed working schedules met by those in service industries. There is a need to examine further the impact of flexible versus non-flexible working, how problems are identified and managed within this occupational group and whether access to health is an issue.

In conclusion, the research identified within this systematic review was limited but did identify a number of evidence gaps that will need to be addressed by future studies including the evaluation of health outcomes in RMWs. Future research should examine issues including health, access to services and training, managing health and well-being and the impact of risk management on physical and health symptom reporting.

Key points

- Musculoskeletal symptoms appear to be an issue associated with longer time periods within vehicles, suggesting better design of vehicles and adjustment within vehicles in addition to ensuring adequate breaks when driving for long periods could reduce symptoms.
- Psychosocial factors were associated with musculoskeletal symptom reporting and demands and control.
- It is currently unclear whether individuals can access occupational health, human resources or training easily when working this way and companies should be aware of this. Managers may need further guidance in managing workers and building trust for those working away from the normal workplace.

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Conflicts of interest

There are no conflicts of interest.

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