Influence of functioning and contextual factors on activity-related travel behaviour in Multiple Sclerosis

Peer-reviewed author version

NEVEN, An; JANSSENS, Davy; WETS, Geert; Beirlant, K.; Willekens, B.; VAN ASCH, Paul; Vanlimbergen, P. & FEYS, Peter (2018) Influence of functioning and contextual factors on activity-related travel behaviour in Multiple Sclerosis. In: Journal of Transport & Health, 11, p. 100-109.

DOI: 10.1016/J.JTH.2018.10.006
Handle: http://hdl.handle.net/1942/28083

Influence of ~~health condition~~functioning and contextual factors on activity-related travel behaviour in Multiple Sclerosis

An Neven,[1*] Davy Janssens,[1] Geert Wets,[1] Karl Beirlant,[2] Barbara Willekens,[3-4] Paul Van Asch,[5] Paul Vanlimbergen,[6] Peter Feys[7]

[1]Hasselt University, Transportation Research Institute (IMOB), Agoralaan, 3590 Diepenbeek, Belgium; [2]National MS Center, Vereeckenstraat 44, 1820 Melsbroek, Belgium; [3]Antwerp University Hospital (UZA), Wilrijkstraat 10, 2650 Edegem, Belgium; [4]De Mick, Rehabilitation Center, Papestraat 30, 2930 Brasschaat, Belgium; [5]Fit Up, Mechelsesteenweg 192 A, 2550 Kontich, Belgium; [6]MS Society Flanders, Boemerangstraat 4, 3900 Overpelt, Belgium; [7]Hasselt University, REVAL Rehabilitation Research Center, BIOMED, Agoralaan, 3590 Diepenbeek, Belgium

*Corresponding author: An Neven, Hasselt University, Transportation Research Institute (IMOB), Agoralaan, 3590 Diepenbeek, Belgium.
Tel: +32(0)11 269 130. Fax: +32(0)11 269 199.
E-mail: an.neven@uhasselt.be

Funding: The study was financially supported by a PhD fellowship from the Research council of Hasselt University (BOF-grant).

Conflicts of interest: Publication is approved by all authors, who report no conflicts of interest.

Acknowledgements: The authors want to thank all PwMS for their voluntary participation. We also acknowledge Veronik Truyens and Greet Adriaenssens, heads of paramedical services of the Rehabilitation Center Overpelt and De Mick Rehabilitation Center Brasschaat, respectively, for facilitation of the study and patient recruitment; as well as vzw Lidwina for facilitation of patient recruitment.

ABSTRACT

OBJECTIVES:

Activity-related travel behaviour is a prerequisite for participation. Knowledge about key factors influencing activity-related travel behaviour is necessary, in order to define guidelines for interventions to optimize this behaviour. The present study 1. investigated to which degree the activity-related travel behaviour in Multiple Sclerosis (MS) does decrease with increasing ambulatory dysfunction and 2. assessed the impact of health condition and contextual factors on activity-related travel behaviour in MS.

METHODS:

A convenience sample of 108 persons with MS was studied, distinguished in three disability subgroups based on Disease Steps (DS). Health condition was assessed by standardized clinical tests about physical, cognitive and psychosocial functioning. Contextual factors (personal and environmental) were collected. Activity-related travel diaries and GPS tracking devices were used to investigate activity-related travel behaviour in terms of number of trips and transport modes used. The influence of health condition measures and contextual factors with activity-related travel behaviour measures was analyzed using Spearman correlations and multiple linear regressions.

RESULTS:

1. Activity-related travel behaviour in MS decreased significantly with increasing ambulatory dysfunction. Significant changes were found regarding travel modes, number, type and planning of activities. 2. Activity-related travel behaviour in MS correlated with both health condition measures and contextual factors. A limited number of standardized tests of health condition and contextual factors (driving ability, household size) can predict activity-related travel behaviour in MS.

CONCLUSIONS:

Both health condition (mostly physical functioning) and contextual factors are predictive for activity-related travel behaviour in MS. Multi-disciplinary teams should include counselling on living situation and on advice regarding environmental factors. Policy makers should be recommended to integrate medical and other services in the community.

Key words: MS (Multiple sclerosis) – Participation – Travel - Activities of Daily Living

1. INTRODUCTION

Multiple Sclerosis (MS), a progressive inflammatory and neurodegenerative disease of the central nervous system, is characterized by various physical, cognitive and psychosocial impairments that may impede social participation. Indeed, difficulties with activities related to all aspects of daily life [1-3], including its social and employment impact [4-5] and barriers obtaining adapted transportation [6], were previously described in persons with MS (PwMS) by using self-report methods. Community walking and physical activity in PwMS was shown, by means of questionnaires and accelerometry, to be decreased [7-8]. Driving ability was investigated, mostly measured by tests in a driving simulator or by computerized driving tests, showing that PwMS performed worse than healthy controls on divided attention [9], and that cognitive impairment negatively affected driving-related skills [10].

However, activity-related travel *behaviour* in MS in general, including the trips PwMS make in real-life, the use of travel modes (including trips by foot, bicycle, specialized transport, assistive devices), travelled distances, among others; has rarely been examined. Previous studies have been conducted with individuals after stroke by semi-structured interviews, indicating an affected use of modes of transport post-stroke [11]; but few data are available about the (changes in) activity-related travel behaviour in PwMS. Being able to travel is a prerequisite to participate in social life, as individuals have a need to perform activities, requiring travelling to the destination of this specific activity. If personal travel possibilities limit this participating, persons may suffer from inadequate integration on the labour market or other participation restrictions, with financial and social impact, leading to reduced quality of life (QoL).

Activity-related travel behaviour in MS has only been documented in a small pilot study with 36 PwMS and 24 healthy controls [12]. It was shown that PwMS with mild ambulatory dysfunction had similar travel characteristics as healthy controls, while significant changes were detected in PwMS with more advanced stages of the disease. However, this descriptive study did not investigate the *determinants* of activity-related travel behaviour. Knowledge about these *key factors influencing changes in activity-related travel behaviour* is necessary in rehabilitation, in order to define guidelines for interventions to optimize this, with social participation enhancement as ultimate goal. Measures of the activity-related travel behaviour may also be used as benchmarks in patients with different levels of ambulatory dysfunction, to detect whether patients are approximately participating as expected.

Previous studies in healthy persons found significant relationships between the activity-related travel behaviour and contextual (personal) factors like income level, age and household structure, among others [13-14]. Previous studies with persons after stroke as well indicated that contextual personal and environmental factors (e.g. lack of company) influenced outdoor walking post-stroke [15]. Therefore, we hypothesize that besides the health condition, also such contextual factors may impact the activity-related travel behaviour in MS.

Therefore, the present study 1. investigated to which degree the activity-related travel behaviour in MS does decrease with increasing ambulatory dysfunction. As well, this study 2. assessed the impact of health condition (physical, cognitive and psychosocial functioning) as well as contextual factors (personal and environmental) on the activity-related travel behaviour in MS. Activity-related travel behaviour was measured in terms of number of trips and transport modes used (in)dependently in their usual environment. A trip means an *outdoor* displacement which is identified by a clear activity motive (e.g. working, shopping), and can consist of one or several travel modes.

2. MATERIALS AND METHODS

2.1. Participants

108 persons with clinical definite MS, based on Poser diagnostic criteria [16], gave written informed consent and participated. The study was approved by the ethical committees of Hasselt University, Rehabilitation Center Overpelt, Antwerp University Hospital and National MS Centre Melsbroek. PwMS were recruited based on databases of the REVAL (Rehabilitation Research Center, UHasselt), by neurologists of the rehabilitation centers, and after information sessions in an MS-specialized fitness center (Fit Up, Kontich) and support groups of the MS Society Flanders. PwMS had to make minimal one trip weekly, and were excluded if they were bedridden, or had a relapse or related corticosteroid treatment within one month before the study.

PwMS were divided in three subgroups, according to their Disease Steps (DS) describing ambulatory dysfunction [17]. The DS is a simple and brief clinical rating scale, based on a general physical examination and the assistive devices needed to walk 25 feet. Persons in the 'mild' subgroup (DS ≤ 2, n=51) experienced no to mild limitations or might have a visible abnormal gait, but did not require ambulation aids. Persons in the 'moderate' subgroup (DS 3-4, n=27) required intermittent or continuous unilateral support to walk more than 25 feet; while persons in the 'severe' subgroup (DS 5-6, n=30) required bilateral support or were confined to a wheelchair. The division in subgroups indicated whether the number of trips, use of travel modes, type and planning of activities, among others; was dependent on the ambulatory dysfunction. The DS is highly associated with the EDSS (Expanded Disability Status Scale) [18-19], but can also be completed by practitioners with the proper training. Since the present study is community-based by which recruitment was also made outside specialized MS centers, the EDSS was not always available in all patients, so the DS was then chosen.

2.2. Study design and outcome measures

The cross-sectional study design was similar as in the preceding pilot study [12]. During the first individual contact moment with the PwMS, measures of physical, cognitive and psychosocial functioning were taken (health condition). Contextual (personal and environmental) data were collected by means of a questionnaire. Activity-related travel behaviour measures were thoroughly explained. Then, during 7 consecutive days, activity-related travel behaviour was measured by completing a travel diary and wearing a GPS logger. These devices were additionally explained in a self-written manual and a permanent helpline was available. In the second meeting, the self-report indices and the GPS logger were returned.

Outcome measures were applied on various levels of the International Classification of Functioning, Disability and Health (ICF) [20], the WHO framework for measuring health and disability. According to the ICF, disability is described as the interaction between features of the person (functioning), and the overall context in which the person lives (contextual factors). In the present study, we aim to assess the impact of both the health condition and contextual factors on the activity-related travel behaviour in MS. In this framework, health is defined as the complete physical, mental and social functioning of a person; by which functioning refers either to all body functions and structures, activities and participation. Therefore, outcome measures on each of these ICF levels were applied in the present study in order to get a complete overview of the health condition of an individual: some measures were conducted on the body functions and structures level; some on the activity level (capacity - what a person can do in a standard environment); and others between the activity and participation level (performance - what a person actually does in his usual environment). An overview of the outcome measures used in this study, classified by the different levels of the ICF framework and along with its detailed ICF category, is shown in figure 1.

INSERT FIGURE 1

Health condition: In order to better understand the main focus of the outcome measures (applied on the different ICF levels), we have labeled the outcome measures of the health condition as being physical, cognitive, or psychosocial. These labels are also shown in figure 1.

The multidimensional *Multiple Sclerosis Functional Composite* (MSFC) measured the ambulation/leg function by the *Timed 25-Foot Walk test* (T25FW), the arm/hand function by the *9-Hole Peg test* (9HPT) and cognition by the *Paced Visual Serial Addition Test* (PVSAT) [21]. Intra- and inter-rater reliability of 0.99 and 1.0 [22].

Physical functioning:

- During the T25FW, PwMS were instructed to walk 25 feet as quickly as possible, using their usual assistive devices. Intraclass correlation coefficient of 0.991 in PwMS [23].
- The *Multiple Sclerosis Walking Scale* (MSWS-12) measured the impact of MS on walking ability. The scale consists of 12 items which are summed to generate a total score with range 0-100. Intraclass correlation coefficient of 0.927 in PwMS [23].
- The 9HPT measured the time needed to put nine pegs in holes in a plastic board, and remove them again. Interrate reliability for right and left hands of r=0.984 and r=0.993 [24].
- The 36-item short-form health survey (SF-36) was used as self-assessment instrument for health related QoL, which yields an eight-scale profile of scores as well as physical and mental health summary measures. Reliability estimates for physical and mental summary scores usually exceed 0.90 [25].

Cognitive functioning:

- The PVSAT measured working memory, attention and arithmetic capabilities (information processing speed). Persons were shown a number every three seconds and asked to say aloud the sum of the second last. There is a significant correlation between the PASAT (Paced Auditory Serial Addition Test) and the PVSAT, the latter considered as useful alternative in the MSFC. Interrate reliability between 0.76-0.95; and test-retest coefficients for short and long test-retest intervals between 0.90-0.97 [26].
- The *Trail Making Test* (TMT), measuring visual attention and task switching, recorded the time persons needed to connect 25 consecutive dots on a sheet of paper (numbers in Part A, numbers/letters in Part B). Retest reliability of TMT A and TMT B between 0.76-0.89, and 0.86-0.94 [27].

Psychosocial functioning:

- The impact of fatigue on daily functioning was measured by the *Modified Fatigue Impact Scale* (MFIS), an ordinal outcome measure. Dutch version of the MFIS has intraclass correlation coefficient of 0.729 [28].
- The level of depression and anxiety was measured by the *Hospital Anxiety and Depression Scale* (HADS). A threshold score of $\geq$8 on the depression subscale provides a sensitivity of 90% and specificity of 87.3% in PwMS. The same cut-off score gives a sensitivity of 88.5% and a specificity of 80.7% on the anxiety subscale for generalized anxiety disorder [29].
- The *Frenchay Activities Index* (FAI) measured instrumental activities of daily living (ADL; e.g. housework, activities outside) which required some initiative from the patient in the last three and six months. Test-retest reliability of 0.96 in the general population [30].
- The mental health summary measure of the SF-36 is labeled as psychosocial functioning.

Health condition of PwMS by subgroup is shown in table 1, in terms of physical, cognitive and psychosocial functioning.

INSERT TABLE 1

Contextual factors: Participants completed a questionnaire about their personal (socio-demographic) situation, e.g. age, education and household. The environmental situation was queried by asking the degree of urbanization (rural areas, regional urban areas,…); as well as questions about the distance to the nearest bus stop from the home location (0-500m, 500m-1km, 1km-5km, >5km), and the distances to family, friends, shops and rehabilitation (physiotherapist, specialized MS center) (0-500m, 500m-1km, 1km-5km, 5km-10km, 10km-20km, >10km). Contextual factors are summarized in table 2.

INSERT TABLE 2

Activity-related travel behaviour: Both self-reported activity-related travel diaries and objective GPS tracking devices were used [12,31]. In the diaries, persons had to indicate all information about their outdoor activities (e.g. activity type, start time and location) and resulting trips (e.g. travel mode and company). Participants were asked to carry out the GPS logger for each trip, by which the current location could be determined and saved in memory. This combination offered detailed information about the actual activity-related travel behaviour in PwMS: the travel diaries revealed information on the activity types, while GPS logging (TranSystem Inc., Hsinchu, Taiwan)[a] allowed obtaining accurate information about travelled routes (e.g. distances), as well as detecting and complementing trips that were not filled out in the travel diaries. In order to limit the day-to-day variability in health condition or in number of external appointments, we have measured during 7 consecutive days including both week and weekend days, identical to guidelines of measuring walking behaviour and physical activity in MS [32]. The outcome measures that were analyzed were: number of trips and activities, travel mode, number of persons, average distances, type and planning of activities, and average duration of activities.

2.3. Statistical analysis

Numerical data were analyzed using SPSS Statistics ($p < 0.05$).

1. Changes in activity-related travel behaviour: Descriptive analyses were used for the standardized tests of the health condition (presented as median and interquartile range (IQR)) and travel diaries (presented as means, SDs and range). The Shapiro-Wilk test indicated non-normal distributions of most health condition variables and therefore, non-parametric Kruskal-Wallis analysis of variance (ANOVA), and post-hoc Mann-Whitney tests for independent samples, were used to examine differences between disability subgroups, regarding both the health condition variables and the activity-related travel behaviour.

2. Assessing the impact of health condition and contextual factors: Bivariate Spearman correlation coefficients were calculated to assess the level of association between the travel outcome measures (number of trips, number of trips made alone, number of trips as car driver), and both the health condition variables and the contextual variables. Hereby, a correlation was considered as poor (<0.30), low (0.30-0.50), moderate (0.50-0.70), high (0.70-0.89), or very high (>0.90). To investigate the predictability of the travel outcome measures by both the health condition variables and the contextual variables, multiple regression analyses with a forward stepwise selection procedure were performed. The highest correlating significant variables (of the health condition and contextual variables) were included as independent variables, and the travel outcome measures as dependent variables. Multicollinearity was checked for all models.

3. RESULTS

3.1. Description of subgroups

The overall significant disparity among subgroups justified the selected cut-off scores 2 and 5 (DS) for differentiating between patients with various ambulatory dysfunction (table 1). Significant differences were found in disease duration, MSFC, all physical and cognitive functioning measures and almost all psychosocial functioning measures. Fatigue was significantly higher in the moderate subgroup.

3.2. Changes in activity-related travel behaviour

Table 3 presents the travel outcomes measures. Significant differences between subgroups were found regarding the number of trips and associating travel mode, and the number, type and planning of activities. PwMS in the mild subgroup made significantly more trips and had a higher share of working trips, and a lower share of social and leisure trips. Both participants in the mild and moderate subgroup made more trips as car driver or with non-motorized travel modes, and performed more bring/get activities. PwMS in the severe subgroup made a high number of trips for rehabilitation, and made more use of assistive devices or adapted transport, while their activities were less spontaneously.

INSERT TABLE 3

3.3. Assessing the impact of health condition and contextual factors

Table 4 displays the correlation coefficients between the travel outcome measures (number of trips per day, number of trips made alone, number of trips as car driver) and both the health condition and the contextual variables. These travel outcome measures were selected because they demonstrate if a person can travel independently. Within the total sample, *the total number of trips* correlated moderately negative with the ambulatory dysfunction (r=-0.52) as measured by the Disease Steps; and positive with the walking ability (T25FW - r=0.56). The total number of trips was lowly correlated with the upper extremity function (9HPT); with the physical part of the health-related QoL (SF36); with divided attention (TMT); and with the frequency of instrumental ADL (FAI). Personal variables correlated poor to low with the total number of trips: negative correlation with age; and positive correlations with education, driving ability, household size and housing type. Associations with environmental factors were absent. The significance level and magnitude of the correlation coefficients were dissimilar among subgroups. In the mild subgroup, the frequency of instrumental ADL (FAI), the educational degree and household size correlated lowly positive with the total number of trips; and the distance to friends and shops negatively. In the moderate subgroup, moderate negative association values were found for the upper extremity function (9HPT) and the distance to the nearest bus stop. In the severe subgroup, the distance to rehabilitation services correlated negatively (r=-0.48) with the total number of trips.

Trips made alone (independently) correlated with the majority of the health condition measures in the total sample, except for information processing speed (PVSAT), the level of anxiety and depression (HADS) and the mental part of the health-related QoL (SF36 mental subscore). The number of trips made alone also correlated with some personal factors: negative correlation with age; and positive correlation with education and work situation.

Regarding *the number of trips as car driver*, all physical and cognitive outcome measures correlated significantly in the total sample (walking ability, upper extremity function, divided attention and information processing speed), while there was no significant influence of the level of fatigue, anxiety or depression (psychosocial functioning). There was a moderately positive correlation with the driving ability (r=0.65), as well a significant (lower) correlation with the household size and degree of urbanization.

INSERT TABLE 4

Table 5 shows the results of the multiple linear regression analyses, performed within the total sample. The walking ability (T25FW) and the frequency of instrumental ADL (FAI) were significant predictors in both the total number of trips and the number of trips made alone. The total number of trips, and those as car driver, were, among others, determined by the household size. The daily number of trips made alone could be predicted by only the physical functioning component of the health condition (T25FW and FAI). Overall, the models better explained variability in the total number of trips, and the number of trips as car driver (respectively 39.4% and 37.6%), which were the models with besides health condition variables also contextual factors as significant predictors.

INSERT TABLE 5

4. DISCUSSION

The present study 1.investigated to which degree the activity-related travel behaviour in MS does decrease with increasing ambulatory dysfunction, and 2. assessed the impact of health condition (physical, cognitive and psychosocial functioning) and contextual factors (personal and environmental) on the activity-related travel behaviour in MS. This study demonstrated that PwMS with moderate to severe ambulatory dysfunction showed significant decreased activity-related travel behaviour compared to those with mild dysfunction, confirming previous pilot findings [12] and literature about daily activities and employment [2-3,5]. Generally, the number of trips correlated with health condition variables as well as contextual factors.

The overall significant associations with the physical functioning measures indicated that the number of trips decreased with increasing ambulatory dysfunction. The 9HPT showed negative correlations, confirming that manual dexterity was also a good predictor of activity and/or participation in MS [33]. Previous studies showed a relation between cognitive tests and impaired driving ability [10,34-35]; but the relation between cognitive function and activity-related travel behaviour was less obvious in the present study. Information processing speed (PVSAT) was not consistently related to the total number of trips. The fact that a decreased processing speed has no significant impact on the activity-related travel behaviour, may be explained by the ‘compensating’ behavioural strategies of the participants: the results show that the majority of the trips is planned beforehand, averages distances are relatively small, and almost half of the trips is made with company. On the other hand, the TMT was significantly associated with the number of trips (in total, made alone and as car driver), indicating that visual attention and task switching plays an important role in the activity-related travel behaviour in MS. Persons suffering from this subdomain of cognitive dysfunction may have difficulties with organizing multiple activities on a single day; leading to a decreased number of trips. Both tests measured different subdomains of cognition, with apparently varying impact on activity-related travel behaviour. Besides cognitive function, previous studies found that psychosocial components like fatigue [36] and anxiety [9] affected driving ability in MS; but those were also not significantly related with the number of trips (in total neither as car driver) in the present study. It is conceivable that contextual personal factors, like social support from household members, may prevent that specific cognitive or psychosocial functioning problems (e.g. decreased processing speed or anxiety feelings) would lead to a decreased activity-related travel behaviour. Indeed, the household size seemed influential for the number of trips in the present study, which can be explained by the fact that households with children, affect individual activity-related travel behaviour [37].

In the moderate subgroup, a moderate correlation was found between the total number of trips and the distance to the nearest bus stop. Although Flemish legislation, based on the urbanization degree, restricts the maximal distance between the home location and the nearest bus stop that needs to be travelled (500-750m), our results may indicate that more physically impaired PwMS were not able to cover these distances. To obtain an increased use of public transport by PwMS, it is therefore important that the accessibility to the stops is improved, e.g. by providing stops closer to the residence of physically impaired persons. A high number of trips in the severe subgroup were made for rehabilitation. However, PwMS living farther away from these rehabilitation services had a lower probability of going to these services, indirectly confirming previous findings [12,38]. In the mild subgroup, the number of trips was dependent on the distance to friends or the nearest shops. Similarly, these destinations were visited more frequently if they were located closer. Thus, also contextual environmental factors (e.g. distances to bus stops or to family or services), may influence the activity-related travel in behaviour in MS. Therefore, enhancing community environments (i.e. integrating medical and other services in the community) could be considered as approach to increase the social participation in MS. Patients could also be advised to consider moving to a housing location closer to medical and rehabilitation services for optimal use.

The multiple regression analyses confirmed that, to measure the activity-related travel behaviour in MS, it is important to take into account not only the health condition (mostly physical functioning), but as well contextual factors. The distance to specific facilities or to family or friends, significantly influences the number of (independent) trips. Respondents were recruited in both rural and urban areas in various provinces in Flanders, and living in both residential and community settings. As well, the disability distribution of PwMS was in line with that of disease severity in Flanders [39].

5. CONCLUSIONS

In conclusion, measuring activity-related travel behaviour in persons with neurological conditions seems essential in rehabilitation, given that its goal is to improve activity and participation in daily life. In order to enhance social participation, the present study has demonstrated, besides mainly (physical functioning components of the) health condition, potential contextual personal and environmental key factors. Based on the present study, multi-disciplinary teams should include counselling on living situation or on advice regarding environmental factors. In this study performed in Flanders, environmental factors, e.g. the distance to facilities, were shown to influence the activity-related travel behaviour. Previously, environmental facilities were similarly related to levels of physical activity [40]. The present results should also motivate policy makers to integrate medical and other services in the community. Eventually, nearby friends and family appeared also key factors in order to enhance participation.

The supplied results of activity-related travel behaviour may also be used as benchmarks in patients with different levels of ambulatory dysfunction, to detect whether patients are approximately participating as expected.

REFERENCES

1. Salter AR, Cutter GR, Tyry T, Marrie RA, Vollmer T. Impact of loss of mobility on instrumental activities of daily living and socioeconomic status in patients with MS. *CMRO* 2010; 26: 493-500.
2. Lexell EM, Iwarsson S, Lexell J. The complexity of daily occupations in Multiple Sclerosis. *Scand J Occup Ther* 2006; 13: 241-248.
3. Einarsson U, Gottberg K, Fredrikson S, Koch L, Widén Holmqvist L. Activities of daily living and social activities in people with Multiple Sclerosis in Stockholm County. *Clinical Rehabilitation* 2006; 20: 543-551.
4. Hakim EA, Bakheit AMO, Bryant TN, Roberts MWH, McIntosh-Michaelis SA, Spackman AJ, et al. The social impact of Multiple Sclerosis - A study of 305 patients and their relatives. *Disabil Rehabil* 2000; 22: 288-293.
5. Phillips LJ, Stuifbergen AK. Predicting continued employment in persons with Multiple Sclerosis. *Journal of Rehabilitation* 2006; 72:35-43.
6. Roessler RT, Bishop M, Rumrill PD, Sheppard-Jones K, Waletich B, Umeasiegbu V, et al. Specialized housing and transportation needs of adults with multiple sclerosis. *Work* 2013; 45: 223-235.
7. Gijbels D, Alders G, Van Heremans E, Charlier C, Roelants M, Broekmans T, et al. Predicting habitual walking performance in multiple sclerosis: relevance of capacity and self-report measures. *Mult Scler J* 2010; 16:618-26.
8. Motl RW, McAuley E, Snook EM, Scott JA. Validity of physical activity measures in ambulatory individuals with multiple sclerosis. *Disabil Rehabil* 2006; 28:1151-1156.
9. Devos H, Brijs T, Alders G, Wets G, Feys P. Driving performance in persons with mild to moderate Multiple Sclerosis. *Disabil Rehabil* 2013; 35:1387-93.
10. Schultheis MT, Garay E, DeLuca J. The influence of cognitive impairment on driving performance in multiple sclerosis. *Neurology* 2001; 56:1089-1094.
11. Wendel K, Stahl A, Risberg J, Pessah-Rasmussen H, Iwarsson S. Post-stroke functional limitations and changes in use of mode in transport. *Scand J Occup Ther* 2010; 17:162-174.
12. Neven A, Janssens D, Alders G, Wets G, Van Wijmeersch B, Feys P. Documenting outdoor activity and travel behaviour in persons with neurological conditions using travel diaries and GPS tracking technology, a pilot study in Multiple Sclerosis. *Disabil Rehabil* 2013; 35: 1718-1725.

13. Contrino H, McGuckin N. Demographics Matter: Travel Demand, Options, and Characteristics Among Minority Populations. *Public Works Management & Policy* 2009; 13:361-368.
14. Syam A, Khan A, Reeves D. Demographics Do Matter: An Analysis of People's Travel Behaviour of Different Ethnic Groups in Auckland. In: Longhurst JWS, Brebbia CA, editors. Urban Transport XVIII. WIT press; 2012.
15. Barnsley L, McCluskey A, Middleton S. What people say about travelling outdoors after their stroke: A qualitative study. *Aust Occup Ther J* 2012; 59:71-78.
16. Poser CM, Paty DW, Scheinberg L, McDonald WI, Davis FA, Ebers GC, et al. New diagnostic criteria for multiple sclerosis: Guidelines for research protocols. *Ann Neurol* 1983; 13: 227–31.
17. Hohol MJ, Orav EJ, Weiner HL. Disease Steps in multiple sclerosis: A simple approach to evaluate disease progression. *Neurology* 1995; 45:251-255.
18. Kurtzke JF. Rating neurologic impairment in multiple sclerosis: an expanded disability status scale (EDSS). *Neurology* 1983; 33:1444-1452.
19. Hohol MJ, Oray EJ, Weiner HL. Disease steps in multiple sclerosis: a longitudinal study comparing disease steps and EDSS to evaluate disease progression. *Mult Scler J* 1999; 5:349-354.
20. WHO. International Classification of Functioning, Disability and Health (ICF). Geneva: World Health Organization, 2001.
21. Nagels G, Geentjens L, Kos D, Vleugels L, D'hooghe MB, Van Asch P, et al. Paced visual serial addition test in multiple sclerosis. *Clin Neurol Surg* 2005; 107:218-222.
22. Rosti-Otajärvi E, Hämäläinen P, Koivisto KLH. The reliability of the MSFC and its components. *Act Neurol Scand* 2008; 117:421-427.
23. Learmonth YC, Dlugonski DD, Pilutti LA, Sandroff BM, Motl RW. The reliability, precision and clinically meaningful change of walking assessments in multiple sclerosis. *Mult Scler J* 2013; 19:1784-1791.
24. Oxford GK, Vogel KA, Le V, Mitchell A, Minuz S, Vollmer MA. Adult norms for a commercially available Nine Hole Peg Test for finger dexterity. *Am J Occup Ther* 2003; 57:570-573.
25. Ware JE. SF-36 health survey update. *Spine* 2000 (Phila Pa 1976); 25:3130-3139.
26. Tombaugh TN. A comprehensive review of the Paced Auditory Serial Addition Test (PASAT). *Arch Clin Neuropsych* 2006; 21:53-76.

27. Wagner S, Helmreich I, Dahmen N, Klaus L, Tadic A. Reliability of Three Alternate Forms of the Trail Making Tests A and B. *Arch Clin Neuropsych* 2011; 26:314-321.
28. Kos D, Kerckhofs E, Nagels G, D'Hooghe BD, Duquet W, Duportail M, et al. Assessing fatigue in multiple sclerosis: Dutch modified fatigue impact scale. *Acta Neurol Belg* 2003; 103:185-191.
29. Honarmand K, Feinstein A. Validation of the Hospital Anxiety and Depression Scale for use with multiple sclerosis patients. *Mult Scler J* 2009; 15:1518-1524.
30. Turnbull JC, Kersten P, Habib M, McLellan L, Mullee MA, George S. Validation of the Frenchay Activities Index in a general population aged 16 years and older. *Arch Phys Med Rehabil* 2000; 81:1034-1038.
31. Bellemans T, Kochan B, Janssens D, Wets G, Timmermans H. In the field evaluation of the impact of a GPS-enabled personal digital assistant on activity-travel diary data quality. *Transportation Research Record: Journal of the Transportation Research Board* 2008; 2049:136-143.
32. Motl RW, Zhu W, Park Y, McAuley E, Scott JA, Snook EM. Reliability of Scores From Physical Activity Monitors in Adults With Multiple Sclerosis. *APAQ* 2007; 24:245-253.
33. Kierkegaard M, Einarsson U, Gottberg K, von Koch L, Holmqvist LW. The relationship between walking, manual dexterity, cognition and activity/participation in persons with multiple sclerosis. *Mult Scler J* 2012; 18:639-646.
34. Lincoln NB, Radford KA. Cognitive abilities as predictors of safety to drive in people with multiple sclerosis. *Mult Scler J* 2008; 14:123-128.
35. Gudesblatt M, Zarif M, Bumstead B, Buhse M, Thotam S, Fafard L, et al. Multiple Sclerosis and Driving: Cognitive Profile Correlation to Patient Self-Reported Driving. *Neurology* 2014; 82 Suppl P4:173.
36. Chipchase SY, Lincoln NB, Radford KA. A survey of the effects of fatigue on driving in people with multiple sclerosis. *Disabil Rehabil* 2003; 25:712-721.
37. Ryley T. Use of non-motorised modes and life stage in Edinburgh. *J Transp Geogr* 2006; 14:367-375.
38. Minden SL, Hoaglin DC, Hadden L, Frankel D, Robbins T, Perloff J. Access to and utilization of neurologists by people with multiple sclerosis. *Neurology* 2008; 70:1141-1149.

39. Kobelt G, Berg J, Lindgren P, Decoo D, Guillaume D, Neymark N, et al. Costs and quality of life for patients with Multiple Sclerose in Belgium. *Eur J Health Econ* 2006; 2:24-33.
40. Doerksen SE, Motl RW, McAuley E. Environmental correlates of physical activity in multiple sclerosis: A cross-sectional study. *Int J Behav Nutr Phys Act* 2007; 4:49.

Suppliers

[a] 747Pro GPS logger, TranSystem Inc., Hsinchu, Taiwan. service@transystem.com.tw

TITLES OF TABLES

Table 1. - Health condition of PwMS by subgroup

Table 2. - Contextual (personal and environmental) factors of PwMS by subgroup

Table 3. - Travel and activity outcome measures of PwMS by subgroup

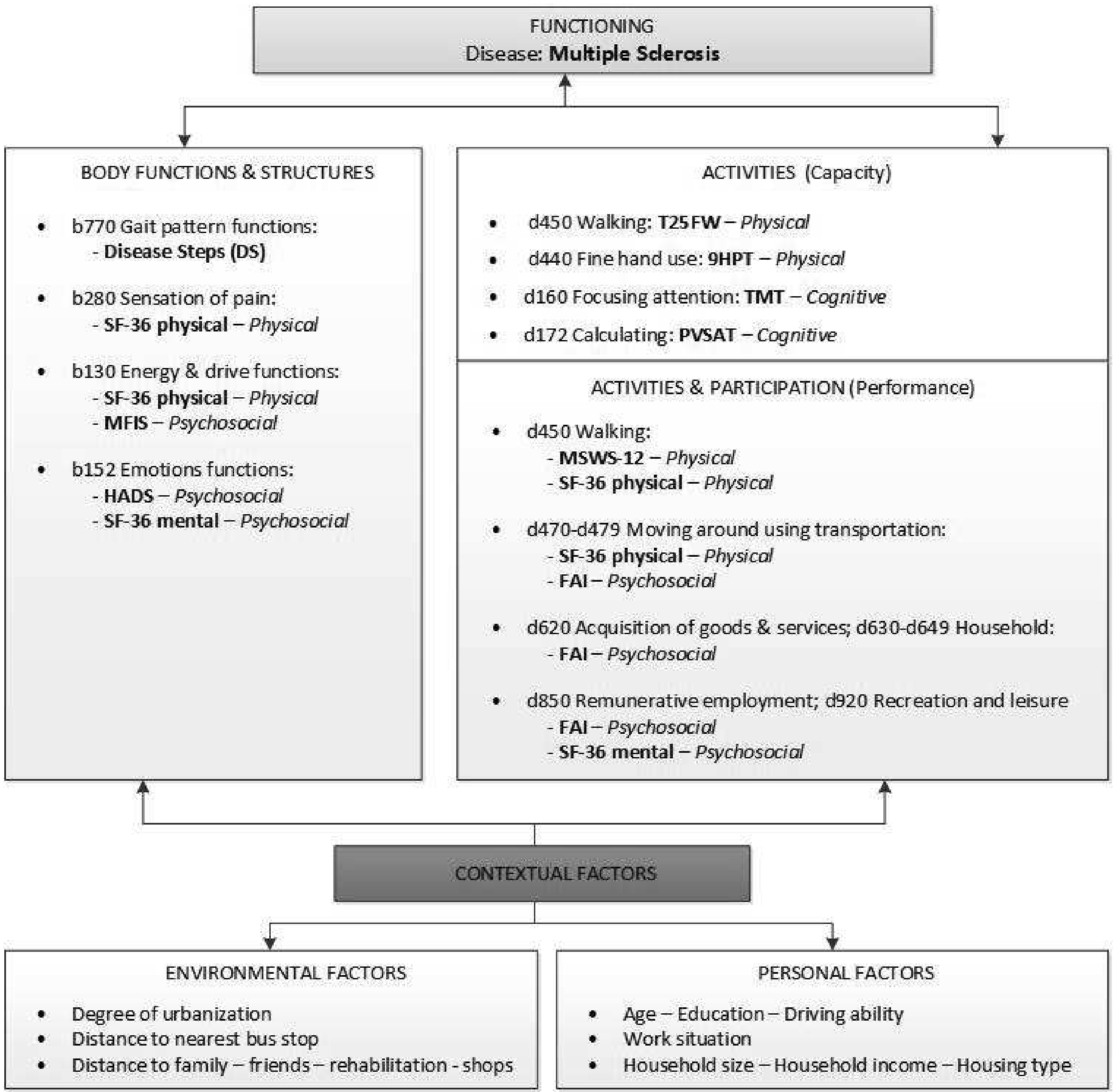
Table 4. - Bivariate Spearman correlation analysis between travel behaviour and health condition and contextual factors of PwMS by subgroup

Table 5. - Multiple linear regression: health condition and contextual factors related to activity-related travel behaviour

TITLES OF FIGURES

Figure 1. – Outcome measures used in this study classified by the ICF framework

Outcome measures: DS, Disease Steps; SF-36, 36-item short-form health survey; MFIS, Modified Fatigue Impact Scale; HADS, Hospital Anxiety and Depression Scale; T25FW, Timed 25-Foot Walk test; 9HPT, 9-Hole Peg Test; TMT, Trail Making Test; PVSAT, Paced Visual Serial Addition Test; MSWS-12, Multiple Sclerosis Walking Scale; FAI, Frenchay Activities Index.



FUNCTIONING
Disease: Multiple Sclerosis
BODY FUNCTIONS & STRUCTURES
b770 Gait pattern functions:
- Disease Steps (DS)
b280 Sensation of pain:
- SF-36 physical – Physical
b130 Energy & drive functions:
- SF-36 physical – Physical
- MFIS – Psychosocial
b152 Emotions functions:
- HADS – Psychosocial
- SF-36 mental – Psychosocial
ACTIVITIES (Capacity)
d450 Walking: T25FW – Physical
d440 Fine hand use: 9HPT – Physical
d160 Focusing attention: TMT – Cognitive
d172 Calculating: PVSAT – Cognitive
ACTIVITIES & PARTICIPATION (Performance)
d450 Walking:
- MSWS-12 – Physical
- SF-36 physical – Physical
d470-d479 Moving around using transportation:
- SF-36 physical – Physical
- FAI – Psychosocial
d620 Acquisition of goods & services; d630-d649 Household:
- FAI – Psychosocial
d850 Remunerative employment; d920 Recreation and leisure
- FAI – Psychosocial
- SF-36 mental – Psychosocial
CONTEXTUAL FACTORS
ENVIRONMENTAL FACTORS
Degree of urbanization
Distance to nearest bus stop
Distance to family – friends – rehabilitation - shops
PERSONAL FACTORS
Age – Education – Driving ability
Work situation
Household size – Household income – Housing type

Table 1: ~~Health condition~~Functioning of PwMS by subgroup

	Mild MS (n = 51) Subgroup 1	Moderate MS (n = 27) Subgroup 2	Severe MS (n = 30) Subgroup 3	Kruskal-Wallis ANOVA	Mann-Whitney post-hoc comparison		
					1-2	**1-3**	**2-3**
Disease Steps	1 (1 - 2)	3 (3 - 4)	5 (5 - 6)	< 0.01	< 0.01	< 0.01	< 0.01
Disease duration (yrs)	8.50 (4.75 - 16.75)	15.00 (10.00 - 18.00)	21.00 (12.50 - 26.50)	< 0.01	< 0.01	< 0.01	< 0.05
MSFC ↑	0.53 (0.30 - 0.75)	- 0.02 (- 0.27 - 0.31)	- 1.60 (- 5.38 - (-0.65))	< 0.01	< 0.01	< 0.01	< 0.01
PHYSICAL FUNCTIONING							
T25FW (m/s) ↑	1.33 (1.13 - 1.63)	0.82 (0.65 - 1.05)	0.21 (0.00 - 0.46)	< 0.01	< 0.01	< 0.01	< 0.01
MSWS-12 ↓	25 (18.75 - 35.50)	48 (42 - 55)	59 (39.50 - 60.00)	< 0.01	< 0.01	< 0.01	ns
9HPT (s) ↓	22.16 (20.08 - 26.09)	27.04 (22.21 - 32.60)	36.41 (29.19 - 53.14)	< 0.01	< 0.01	< 0.01	< 0.01
SF36 physical ↑	40.35 (32.05 - 45.55)	28.40 (22.60 - 35.60)	20.60 (15.00 - 27.35)	< 0.01	< 0.01	< 0.01	< 0.01
COGNITIVE FUNCTIONING							
TMT (s) ↓	44.79 (33.19 - 59.16)	55.76 (42.58 - 70.67)	75.47 (60.40 - 163.28)	< 0.01	< 0.05	< 0.01	< 0.01
PVSAT ↑	54 (49 - 59)	53 (45 - 57)	35 (29 - 55)	< 0.01	ns	< 0.01	< 0.05
PSYCHOSOCIAL FUNCTIONING							
MFIS ↓	31 (16.50 - 43.50)	46 (38 - 59)	40 (20.50 - 52.25)	< 0.01	< 0.01	ns	< 0.05
HADS ↓	8 (5 - 14)	14 (7 - 20)	11 (5 - 18.25)	0.04	< 0.05	ns	ns
FAI ↑	30 (24 - 35)	26 (21 - 30)	17 (12 - 24)	< 0.01	< 0.01	< 0.01	< 0.01
SF36 mental ↑	52.40 (44.05 - 58.80)	49.40 (38.30 - 59.60)	55 (48 - 60)	ns	/	/	/

Values are median (IQR). Ns: not significant. Upward arrows indicate better performance with higher scores; downward arrows indicate worse performance with higher scores.
PwMS, Persons with Multiple Sclerosis; MS, Multiple Sclerosis; ANOVA, Analysis of variance.
Outcome measures: MSFC, Multiple Sclerosis Functional Composite; T25FW, Timed 25-Foot Walk test; MSWS-12, Multiple Sclerosis Walking Scale; 9HPT, 9-Hole Peg test; SF-36, 36-item short-form health survey; TMT, Trail Making Test; PVSAT, Paced Visual Serial Attention Test; MFIS, Modified Fatigue Impact Scale; HADS, Hospital Anxiety and Depression Scale; FAI, Frenchay Activities Index.

Table 1: Contextual (personal and environmental) factors of PwMS by subgroup

	Mild (n = 51) *	**Moderate (n = 27)**	**Severe (n = 30)**	**Total (n=108)**
PERSONAL FACTORS				
Gender (M/F)	16/34	13/14	12/18	41/66
Age (22-34/35-44/45-54/55-64)	7/15/20/8	1/4/8/12/2	0/5/6/7/12	8/24/34/27/14
Type of MS (RR/SP/PP/unknown)	39 /1/4/6	10/6/9/2	2/11/13/4	51/18/26/12
Education (primary/secondary/higher)	3/25/22	1/17/9	4/19/7	8/61/38
Driving ability (no/uncertain/yes)	7/4/39	5/4/18	18/2/10	30/10/67
Work (not working/half-time/full-time)	31/10/9	22/5/0	28/1/1	81/16/10
Housing type (appartment/house)	8/42	6/21	6/24	20/87
Household size (1 pers/2 pers/more than 2)	5/17/28	3/13/11	10/13/7	18/43/46
Household income (< €1000/€1000-€2500/ €2500-€5000/> €5000/ unknown)	0/20/21/1/8	0/10/10/0/7	1/12/5/0/12	1/42/36/1/27
ENVIRONMENTAL FACTORS				
Degree of urbanization (Flemish Periphery around Brussels/metropolitan areas/regional urban areas/structure supporting small urban areas/small urban areas at provincial level/rural areas)	0/6/11/3/ 13/17	1/8/4/2/ 3/9	1/2/7/2/ 8/10	2/16/22/7/ 24/36

Values are number of PwMS. *Missing data of 1 PwMS in mild subgroup.
PwMS, Persons with Multiple Sclerosis; MS, Multiple Sclerosis.
RR: relapsing-remitting; SP: secondary progressive; PP: primary progressive.

Table 1: Travel and activity outcome measures of PwMS by subgroup

	Mild MS (n = 51) Subgroup 1	Moderate MS (n = 27) Subgroup 2	Severe MS (n = 30) Subgroup 3	Kruskal-Wallis ANOVA	Mann-Whitney post-hoc comparison		
					1-2	1-3	2-3
TRAVEL BEHAVIOUR							
Number of trips per day	5.0 ± 1.8 (0.9 - 9.7)	3.4 ± 1.3 (1.3 - 7.1)	2.7 ± 1.5 (0.6 - 6.6)	< 0.01	< 0.01	< 0.01	< 0.05
Travel mode (%)							
Car driver	45.7 ± 29.9 (0.0 - 96.6)	41.1 ± 35.4 (0.0 - 100.0)	21.2 ± 31.7 (0.0 - 100.0)	< 0.01	ns	< 0.01	< 0.05
Car passenger	17.0 ± 17.6 (0.0 - 73.5)	24.1 ± 27.1 (0.0 - 100.0)	33.4 ± 35.5 (0.0 - 100.0)	ns	/	/	/
Car unknown *	8.2 ± 13.9 (0.0 - 54.3)	4.7 ± 6.9 (0.0 - 27.3)	3.6 ± 9.0 (0.0 - 33.3)	< 0.05	ns	< 0.01	0.10
Non-motorised	20.7 ± 25.6 (0.0 - 83.3)	14.4 ± 20.1 (0.0 - 66.7)	4.9 ± 12.5 (0.0 - 50.0)	< 0.01	ns	< 0.01	< 0.01
Public transport	3.4 ± 11.8 (0.0 - 80.0)	6.9 ± 18.6 (0.0 - 87.5)	0.6 ± 1.8 (0.0 - 6.3)	ns	/	/	/
Assistive device	0.0 - 0.0 (0.0 - 0.0)	5.6 ± 19.4 (0.0 - 100.0)	26.2 ± 36.8 (0.0 - 95.5)	< 0.01	< 0.01	< 0.01	< 0.05
Adapted transport	0.2 ± 1.7 (0.0 - 11.8)	0.3 ± 1.4 (0.0 - 7.4)	3.9 ± 7.8 (0.0 - 27.8)	< 0.01	ns	< 0.01	< 0.05
Other/unknown	4.9 ± 14.5 (0.0 - 100.0)	2.9 ± 6.3 (0.0 - 30.0)	6.2 ± 17.7 (0.0 - 70.6)	ns	/	/	/
Number of persons (%)							
1 person	46.7 ± 21.6 (0.0 - 91.4)	47.0 ± 25.7 (0.0 - 100.0)	35.5 ± 34.9 (0.0 - 92.0)	ns	/	/	/
2 persons or more	34.2 ± 20.2 (0.0 - 67.6)	37.3 ± 22.5 (0.0 - 81.8)	46.1 ± 33.5 (0.0 - 100.0)	ns	/	/	/
Unknown	19.1 ± 26.5 (0.0 - 100.0)	15.8 ± 14.9 (0.0 - 50.0)	18.5 ± 24.9 (0.0 - 100.0)	ns	/	/	/
Average distance (km)	7.68 ± 4.27 (1.47 - 21.56)	8.24 ± 4.28 (2.02 - 17.75)	7.90 ± 7.26 (0.83 - 33.60)	ns	/	/	/
ACTIVITIES							
Number of activities per day	3.0 ± 1.1 (0.4 - 5.6)	2.0 ± 0.8 (0.7 - 4.4)	1.5 ± 0.9 (0.3 - 3.7)	< 0.01	< 0.01	< 0.01	< 0.05
Type of activity (%)							
Working	8.5 ± 14.3 (0.0 - 80.0)	3.9 ± 9.8 (0.0 - 40.0)	0.8 ± 4.1 (0.0 - 22.2)	< 0.01	< 0.05	< 0.01	0.07
Education	3.1 ± 7.3 (0.0 - 38.5)	0.5 ± 1.8 (0.0 - 8.3)	0.4 ± 2.1 (0.0 - 11.1)	< 0.05	0.072	< 0.05	ns
Shopping	19.9 ± 14.7 (0.0 - 66.7)	20.7 ± 15.3 (0.0 - 66.7)	21.5 ± 25.3 (0.0 - 100.0)	ns	/	/	ns
Services	7.0 ± 7.9 (0.0 - 27.3)	9.4 ± 13.6 (0.0 - 60.0)	4.7 ± 9.1 (0.0 - 37.5)	ns	/	/	/
Social and leisure	23.7 ± 17.2 (0.0 - 71.4)	31.1 ± 15.5 (0.0 - 61.5)	37.0 ± 23.9 (0.0 - 80.0)	< 0.05	< 0.05	< 0.05	ns
Bring / Get	9.4 ± 13.4 (0.0 - 54.2)	6.3 ± 8.4 (0.0 - 26.7)	2.2 ± 6.0 (0.0 - 22.7)	< 0.01	ns	< 0.01	< 0.05
Rehabilitation	7.1 ± 7.0 (0.0 - 26.3)	13.2 ± 10.6 (0.0 - 33.3)	16.5 ± 14.4 (0.0 - 50.0)	< 0.01	< 0.05	< 0.01	ns
Walking	7.3 ± 13.1 (0.0 - 47.8)	4.6 ± 8.0 (0.0 - 25.0)	7.6 ± 12.0 (0.0 - 37.5)	ns	/	/	/
Other / Unknown	14.2 ± 19.6 (0.0 - 100.0)	10.5 ± 11.6 (0.0 - 41.7)	9.3 ± 12.6 (0.0 - 40.0)	ns	/	/	/
Average duration (min)	92.7 ± 76.7 (16 - 456)	87.1 ± 50.4 (21 - 225)	76.1 ± 34.9 (26 - 149)	ns	/	/	/
Planning of activity (%)							
Planned	69.8 ± 22.9 (0.0 - 100.0)	69.2 ± 22.5 (0.0 - 100.0)	65.3 ± 35.2 (0.0 - 100.0)	ns	/	/	/
Spontaneous	17.0 ± 14.4 (0.0 - 47.4)	18.4 ± 14.9 (0.0 - 68.8)	11.1 ± 24.1 (0.0 - 100.0)	< 0.01	ns	< 0.01	< 0.01
Unknown	13.3 ± 21.8 (0.0 - 100.0)	12.5 ± 18.3 (0.0 - 58.3)	20.9 ± 28.3 (0.0 - 100.0)	ns	/	/	/

Values are mean ± SD (range). Ns: not significant.
* Car driver or passenger unknown because not reported in travel diary.
PwMS, Persons with Multiple Sclerosis; MS, Multiple Sclerosis; ANOVA, Analysis of variance.

Table 1: Bivariate Spearman correlation analysis between travel behaviour and ~~health condition~~functioning and contextual factors of PwMS by subgroup

	Nr of Trips per Day				Nr of Trips Made Alone	Nr of Trips as Car Driver
MS subgroup	**Total**	**Mild**	**Mod**	**Sev**	**Total**	**Total**
FUNCTIONING						
Disease Steps	**- 0.52 †**	ns	ns	ns	ns	**- 0.44 †**
Disease duration	**- 0.29 †**	ns	**- 0.41 ***	ns	**0.24 ***	**- 0.43 †**
MSFC	**0.47 †**	ns	**0.41 ***	ns	**0.38 †**	**0.50 †**
Physical functioning						
T25FW	**0.56 †**	ns	ns	ns	**0.43 †**	**- 0.50 †**
MSWS-12	**- 0.40 †**	ns	ns	ns	**- 0.30 †**	**- 0.22 ***
9HPT	**- 0.41 †**	ns	**- 0.60 †**	ns	**- 0.39 †**	**- 0.41 †**
SF36 physical	**0.40 †**	ns	ns	ns	**0.31 †**	**0.27 †**
Cognitive functioning						
TMT	**- 0.30 †**	ns	ns	ns	**- 0.27 †**	**- 0.39 †**
PVSAT	ns	ns	ns	ns	ns	**- 0.29 †**
Psychosocial functioning						
MFIS	ns	ns	ns	ns	**- 0.20 ***	ns
HADS	ns	ns	ns	ns	ns	ns
FAI	**0.44 †**	**0.31 ***	ns	ns	**0.36 †**	**0.42 †**
SF36 mental	ns	ns	ns	ns	ns	ns
CONTEXTUAL ¥						
Personal factors						
Age	**- 0.36 †**	ns	ns	ns	**- 0.32 †**	**- 0.30 †**
Education	**0.21***	**0.39 †**	ns	ns	**0.31 †**	ns
Driving ability	**0.25 ***	ns	ns	ns	ns	**0.65 †**
Work situation	ns	ns	ns	ns	**0.20 ***	**0.21 ***
Household size	**0.33 ***	**0.38 †**	ns	ns	ns	**0.33 †**
Household income	ns	ns	ns	ns	ns	ns
Housing type	**0.19 ***	**0.33 ***	ns	ns	ns	ns
Environmental factors						
Degree of urbanization	ns	ns	ns	ns	ns	**0.22 ***
Distance to bus stop	ns	ns	**- 0.54 †**	ns	ns	ns
Distance to family	ns	ns	ns	ns	ns	ns
Distance to friends	ns	**- 0.35 ***	ns	ns	ns	ns
Distance to rehab	ns	ns	ns	**- 0.48 †**	ns	ns
Distance to shops	ns	**- 0.29 ***	ns	ns	ns	ns

Ns: not significant. Significant correlation coefficient: * $p < 0.05$, † $p < 0.01$
¥ Categories of these variables are described in table 2 and in 'Study design and outcome measures'.
PwMS, Persons with Multiple Sclerosis; MS, Multiple Sclerosis.
Outcome measures: MSFC, Multiple Sclerosis Functional Composite; T25FW, Timed 25-Foot Walk test; MSWS-12, Multiple Sclerosis Walking Scale; 9HPT, 9-Hole Peg test; SF-36, 36-item short-form health survey; TMT, Trail Making Test; PVSAT, Paced Visual Serial Attention Test; MFIS, Modified Fatigue Impact Scale; HADS, Hospital Anxiety and Depression Scale; FAI, Frenchay Activities Index.

Table 1: Multiple linear regression: health conditionfunctioning and contextual factors related to activity-related travel behaviour

	DAILY NUMBER OF TRIPS			NUMBER OF TRIPS MADE ALONE			NUMBER OF TRIPS AS CAR DRIVER		
	β	SE	t	β	SE	t	β	SE	t
FUNCTIONING									
Disease duration							-0.05	0.02	-3.46 †
T25FW	1.34	0.38	3.55 †	0.68	0.30	2.25 *			
FAI	0.06	0.02	2.47 *	0.04	0.02	2.11 *			
CONTEXTUAL FACTORS									
Driving ability							0.74	0.16	4.51 †
Household size	0.46	0.23	2.04 *				0.41	0.19	2.17 *
OVERALL MODEL									
R^2	0.394			0.197			0.376		
Adjusted R^2	0.374			0.180			0.356		
β constant	0.22			0.15			0.47		
Standard error	0.65			0.41			0.54		
p	< 0.001			< 0.001			< 0.001		

R^2: predictive value; β: estimate; SE: standard error; t: t-value.
Significant regression coefficient: * $p < 0.05$, † $p < 0.01$.
Outcome measures: T25FW, Timed 25-Foot Walk test; FAI, Frenchay Activities Index.