

# Supplementary Material

## Time Investment for Program Implementation to Manage Neuropsychiatric Symptoms: An Observational Longitudinal Study in In-Home and Residential Care Settings

**Supplementary Table 1.** Unmet needs, contents of the action plan, and type of caregiver involved in the interdisciplinary discussion meeting at baseline.

|  | N (%) at baseline |
|--|-------------------|
| Unmet needs  |                   |
| Another person is bothering the person             | 67 (53.6)         |
| Sleepiness or tiredness                            | 58 (46.4)         |
| Pain   | 55 (44.0)         |
| Urination  | 52 (41.6)         |
| Feeling uncomfortable                              | 49 (39.2)         |
| Evacuation   | 47 (37.6)         |
| Rash/fungus  | 36 (28.8)         |
| Blood pressure                                     | 34 (27.2)         |
| Being cold/hot                                     | 33 (26.4)         |
| Social isolation                                   | 30 (24.0)         |
| Hearing  | 28 (22.4)         |
| Medication   | 24 (19.2)         |
| Meal   | 22 (17.6)         |
| Drink  | 22 (17.6)         |
| Eyesight   | 21 (16.8)         |
| Body positioning                                   | 16 (12.8)         |
| Breathing  | 13 (10.4)         |
| Lighting   | 11 (8.8)          |
| Blood sugar  | 9 (7.2)           |
| Furniture  | 9 (7.2)           |
| Temperature  | 6 (4.8)           |
| Pulse  | 6 (4.8)           |
| Restraints   | 0 (0.0)           |
| Action plan  |                   |
| Pleasant activity/recreation                       | 38 (30.4)         |
| Outdoor activity                                   | 20 (16.0)         |
| Calm environment/removal of environmental triggers | 17 (13.6)         |
| Music/song   | 16 (12.8)         |

|  |            |
|--|------------|
| Physical activity/exercise   | 9 (7.2)    |
| Massage/touching   | 8 (6.4)    |
| Type of caregiver involved in the interdisciplinary discussion meeting |            |
| Direct care worker who was not a nurse                                 | 123 (98.4) |
| Care manager   | 80 (64.0)  |
| Nurse  | 42 (33.6)  |
| Family member  | 5 (4.0)    |
| Occupational therapist   | 2 (1.6)    |
| Physical therapist   | 1 (0.8)    |
| Doctor   | 0 (0.0)    |

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**Supplementary Table 2.** Time investment for professionals per category of program implementation

| Minute, mean (SD) | Baseline (N=119) | T1 (N=111)  | T2 (N=108)  |
|-------------------|------------------|-------------|-------------|
| Preparation       | 68.2 (67.9)      | 42.0 (41.9) | 32.1 (27.7) |
| Transportation    | 5.8 (12.1)       | 4.9 (12.2)  | 4.2 (11.4)  |
| Meeting           | 73.2 (36.1)      | 52.0 (29.5) | 42.0 (22.9) |
| Web-based tool    | 46.5 (35.2)      | 27.6 (21.9) | 22.8 (21.8) |

*Preparation* included efforts to explain summary of the program and ask for the participation of other care professionals, such as printing and distribution of the leaflet/introduction movie/textbook of the training course/check sheet for assessment, talk by phone and/or in face-to-face visit. *Transportation* referred to cases in which participating professionals were care managers in management agencies so that they went to the office of other in-home service providers to hold the interdisciplinary meeting. *Meeting* accounted for the time spent holding the interdisciplinary discussion meeting between the participating professional and other caregivers. *Web-based tool* meant the total number of minutes to input information on the person with dementia using the web-based tool.

**Supplementary Table 3.** Percentage of presence and reason for declining to participate in the discussion meeting at baseline

|  | In-home care              |                            | Residential care     |                        |
|--|---------------------------|----------------------------|----------------------|------------------------|
|  | Care management<br>(N=38) | Multiple in-home<br>(N=25) | Group home<br>(N=33) | Nursing home<br>(N=23) |
| Number of participants, mean (SD)                                  | 2.1 (1.3)                 | 4.0 (2.2)                  | 2.9 (1.8)            | 4.0 (1.6)              |
| Presence of other professionals who declined to participate, N (%) |                           |                            |                      |                        |
| No one declined  | 19 (50.0)                 | 14 (56.0)                  | 13 (39.4)            | 7 (30.4)               |
| There were professionals who declined                              | 13 (33.3)                 | 5 (20.0)                   | 18 (54.5)            | 13 (56.5)              |
| Time constraint  | 12 (31.6)                 | 2 (8.0)                    | 10 (30.3)            | 8 (34.8)               |
| Out of regular work time   | 2 (5.1)                   | 3 (12.0)                   | 0 (0.0)              | 6 (26.1)               |
| Did not know the program and doubted its efficacy                  | 0 (0.0)                   | 0 (0.0)                    | 2 (6.1)              | 0 (0.0)                |
| Director of provider did not permit                                | 0 (0.0)                   | 0 (0.0)                    | 0 (0.0)              | 1 (4.4)                |
| Other, unspecified   | 4 (10.5)                  | 7 (8.0)                    | 8 (24.2)             | 6 (26.1)               |
| Did not respond to the question                                    | 7 (18.4)                  | 6 (24.0)                   | 2 (6.1)              | 3 (13.0)               |

**Supplementary Table 4.** Factors relating to each category of time investment for the program implementation

| Coefficient (95% confidence interval)                 | Preparation              | Meeting                  | Web-based tool           |
|---|--------------------------|--------------------------|--------------------------|
| Type of provider, reference=in-home care management   |                          |                          |                          |
| Multiple in-home service provider                     | 13.73 (-8.08, 35.55)     | -1.05 (-16.07, 13.96)    | 6.40 (-6.54, 19.33)      |
| Group home  | 45.14* (21.94, 68.35)    | 10.37 (-5.63, 26.37)     | 14.84* (1.07, 28.61)     |
| Nursing home  | 30.42* (5.52, 55.32)     | 5.99 (-11.10, 23.08)     | 8.55 (-6.20, 23.30)      |
| Time of evaluation, reference=baseline                |                          |                          |                          |
| T1  | -26.81* (-36.67, -16.94) | -20.34* (-25.86, -14.83) | -18.57* (-24.01, -13.12) |
| T2  | -37.06* (-47.30, -26.83) | -29.22* (-34.96, -23.47) | -23.46* (-29.12, -17.80) |
| <i>Characteristics of care professionals</i>          |                          |                          |                          |
| Primary qualification, care manager/social worker     | 19.85* (0.50, 39.20)     | -2.39 (-15.74, 10.97)    | -1.47 (-12.96, 10.02)    |
| Tenure in care for older adults, month                | 0.10* (0.01, 0.19)       | 0.03 (-0.03, 0.09)       | 0.07* (0.01, 0.12)       |
| Competence in dementia care (17-68)                   | -1.38* (-2.36, -0.40)    | -0.54 (-1.21, 0.13)      | -0.44 (-1.02, 0.14)      |
| <i>Characteristics of persons with dementia</i>       |                          |                          |                          |
| Age at baseline, year                                 | 0.89 (-0.12, 1.90)       | -0.02 (-0.72, 0.68)      | -0.23 (-0.83, 0.37)      |
| Sex, male   | 9.42 (-6.38, 25.22)      | 4.35 (-6.49, 15.20)      | 5.56 (-3.80, 14.92)      |
| Type of dementia, Alzheimer's disease                 | 4.38 (-10.02, 18.77)     | 6.06 (-3.83, 15.94)      | 4.49 (-4.04, 13.02)      |
| Prescribed medication                                 |                          |                          |                          |
| N05A: antipsychotics                                  | -3.32 (-19.73, 13.10)    | -1.66 (-12.73, 9.41)     | -0.20 (-9.87, 9.47)      |
| N06D: anti-dementia drugs                             | 9.97 (-2.85, 22.80)      | -4.13 (-12.79, 4.53)     | -3.67 (-11.24, 3.89)     |
| Level of neuropsychiatric symptoms (0-144)            | 0.08 (-0.27, 0.42)       | 0.19 (-0.03, 0.40)       | -0.01 (-0.20, 0.19)      |
| Interclass correlation coefficient, care professional | 0.170                    | 0.249                    | 0.198                    |

Multilevel linear regression analysis including person with dementia and care professionals as random effects. Competence in dementia care was measured by the Japanese version of the Sense of Competence in Dementia Care Staff scale. Level of neuropsychiatric symptoms was assessed using the Japanese version of the Neuropsychiatric Inventory-Nursing Home version (NPI-NH). \*p < 0.05.