



Research article

Cross-sectional investigation of relationships between the organisational environment and challenging behaviours in support services for residents with intellectual disabilities

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ARTICLE INFO

Keywords:

Social science
Psychology
Challenging behaviour
Organisational environment
Ecological theory
Intellectual disabilities

ABSTRACT

Background: This study was conducted to assess relationships between the organisational environment and three types of challenging behaviour (self-injurious, aggressive/destructive and stereotypical) in support services for residents with intellectual disabilities using ecological theory.**Method:** A cross-sectional questionnaire-based design was used to identify relationships between ecological system aspects at multiple levels (micro-, meso-, exo-, macro- and chronosystems) and challenging behaviours of residents. A questionnaire was distributed to care professionals and managers working in specialised Dutch service organisations for residents with intellectual disabilities and challenging behaviour. The data were examined by Pearson correlation and multivariate regression analyses.**Results:** The questionnaire was completed by 922 respondents from 21 organisations. Responses revealed that organisational aspects at the micro-, meso-, exo- and macrosystem levels play roles in residents' challenging behaviour. These aspects range from staff members' ability to sensitively interact with residents to grouping of residents with challenging behaviour, and staff turnover.**Conclusions:** In the prevention and management of challenging behaviour of residents with intellectual disabilities, the consideration of ecological aspects at all system levels in the organisational environment is required.

1. Introduction

Management of the challenging behaviours of residents with intellectual disabilities is an important and complex issue in the provision of residential support services, which can be studied from the perspective of ecological theory (Bronfenbrenner, 1979, 1994, 1999; Bronfenbrenner and Morris, 2006; Allen et al., 2013; Hastings et al., 2013; Bigby and Beadle-Brown, 2018; Olivier-Pijpers et al., 2018). In the residential support context, this theory posits that complex reciprocal interactions between an active, bio-psychologically developing resident (the ontosystem) and his or her environment influence the resident's functioning and development (Bronfenbrenner and Morris, 2006). Challenging behaviour is a social construct; in the residential support context, it is the result of a resident's direct interactions with other residents and staff, and indirect relationships with others in the service organisation (Emerson, 2001; Emerson and Einfeld, 2011; Allen et al., 2013). Emerson (2001) defined challenging behaviour as culturally abnormal behaviour(s)

which endangers the physical safety of the person or others, or limits the use of or access to ordinary community facilities. The occurrence of these behaviours reflects the abilities of the immediate and broader environments to properly support people with intellectual disabilities (Royal College of Psychiatrists, 2007, 2016; Allen et al., 2013). According to ecological theory, a resident's environment consists of four nested 'layers': the microsystem (i.e. face-to-face interactions with residents and staff members), the mesosystem (i.e. interactions between microsystems, such as the group home and day-care staff), the exosystem (i.e. interactions within the residential disability service organisation) and the macrosystem (i.e. societal rules, funding systems and attitudes). The chronosystem embodies changes in the five ecological systems over time (Bronfenbrenner, 1979, 1994, 1999; Bronfenbrenner and Morris, 2006).

Aspects associated with residents' challenging behaviour can be found at all ecological system levels. At the microsystem level, for example, the stability of the relationship between a resident and a staff member results in trust, and subsequently in less stress for the resident, positively

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influencing challenging behaviour. The anxiety of staff members is linked negatively to residents' challenging behaviour because of the tension it creates in the staff member's actions toward residents (Willems et al., 2012; Olivier-Pijpers et al., 2018, 2019). The involvement of family members in a resident's daily life and support services may also influence challenging behaviour, as family members are able to advocate for support of the resident's specific needs (Olivier-Pijpers et al., 2019). At the mesosystem level, for example, the ability of the staff to manage daily agitations of a given resident and between other residents in the group may influence challenging behaviour, as agitation in the group home can trigger such behaviour. Furthermore, staff members who feel that they are permitted to make mistakes in providing support to residents are better able to learn from these mistakes and adjust their actions in subsequent incidents involving challenging behaviour (Knotter et al., 2013; Olivier-Pijpers et al., 2019). Exosystem aspects that seem to be associated with challenging behaviour include the management's leadership style, coaching by psychologists, a supportive team environment for care professionals, a positive organisational culture and the translation of personnel policies into daily practices; all of these aspects provide the staff guidance on proper support of residents, resulting in the occurrence of fewer incidents involving challenging behaviour (Dilworth et al., 2011; Allen et al., 2013; Deveau and McGill, 2016, 2019; Bigby and Beadle-Brown, 2018; McGill et al., 2018; Olivier-Pijpers et al., 2018; Olivier-Pijpers et al., 2019). Macrosystem aspects linked to challenging behaviour include negative media attention to bad practices, which results in a focus on control instead of trust of staff members to support residents, in turn negatively influencing challenging behaviour (Olivier-Pijpers et al., 2019). Finally, one chronosystem aspect associated with challenging behaviour consists of changing societal views of residents and their support services (e.g. in institutions or the community), which are linked to the way in which an organisation structures support services for residents with intellectual disabilities and challenging behaviour (Tossebro et al., 2012; Olivier-Pijpers et al., 2018). These ecological system aspects also influence each other; for example, challenging behaviour in residents (ontosystem) is influenced by staff members' sensitivity (microsystem), which in turn is influenced by positive interactions among staff members (mesosystem). These positive interactions are influenced by the organisational vision and management's leadership (exosystem), which are subject to governmental policies and societal values (macrosystem) (Deveau and McGill, 2016; Olivier-Pijpers et al., 2018, 2019).

Because of the multitude of organisational aspects and interplay among them that influence challenging behaviour, a more in-depth examination of the influences of the organisational environment of support services for residents with intellectual disabilities on staff's attitudes and competencies, and subsequent challenging behaviours of residents, is needed (Gomez et al., 2016; Bigby and Beadle-Brown, 2018). Previous ecological studies of this organisational environment have been qualitative; quantitative studies are lacking (cf. Gomez et al., 2016; Bigby and Beadle-Brown, 2018). The aim of this quantitative study was to explore the relationships between the organisational environment and three types of challenging behaviour (self-injurious, aggressive/destructive and stereotypical behaviours) of residents with intellectual disabilities using ecological theory. Using a cross-sectional questionnaire-based design, we measured ecological system aspects on all levels with a large sample of care professionals and managers in Dutch residential disability service organisations.

2. Methods

2.1. Setting and procedure

We invited specialised Dutch service organisations for residents with intellectual disabilities and challenging behaviours to participate in this study. Our contact people (administrator of challenging behaviour policies, psychologist or manager in such support services) selected care

professionals (group home or day-care staff members and psychologists) and managers (heads of group and managers) involved with residents with intellectual disabilities and challenging behaviour in these organisations. We tested the sample size with respect to our 37 independent variables with an alpha level of 0.05, power of 0.9 and effect size of 0.2, using XLSTAT 2020.3.1.11, which indicated that a sample of 192 cases was needed. We included organisations with response rates exceeding 25% and 10 cases; such rates are not uncommon for email-based surveys (Sheehan, 2001; Stolzman et al., 2018). We excluded organisations that accepted participation but took no action, and service organisations, care professionals and managers providing support services for residents with intellectual disabilities without challenging behaviour. Reasons given for non-participation included organisations' participation in too many studies and contact persons' inability to recruit sufficient numbers of participants. We also excluded organisations for residents without intellectual disabilities, but with other disabilities; these organisations differ from the disability service organisations in which we aimed to study ecological system aspects of residents with intellectual disabilities and challenging behaviour. Selected respondents received a brief introduction to the study and a link to the Dutch online questionnaire, administered with the Qualtrics software (version XM, 2019; Qualtrics, Provo, UT, USA).

2.2. Ethics

The Dutch Central Committee on Research Involving Human Subjects confirmed that this research did not fall under the scope of the Medical Research Involving Human Subjects Act.

2.3. Measures

Questionnaire components were validated instruments from the literature and, when no relevant instrument could be found, items were developed based on previous qualitative studies (Olivier-Pijpers et al., 2018, 2019). Dutch versions of the Behavior Problems Inventory (BPI-01), Living Group Work Climate Inventory (LGWCI), Staff-Resident Interactive Behaviour Inventory (SCIBI), Family Perceived Involvement (FPI) instrument and Care Staff Attitude Questionnaire (CSAQ) were available and used; the authors translated English versions of the Nursing Home Survey on Patient Safety Culture (NHSPSC), Quality-Work Competence (QWC) questionnaire and Psychosocial Safety Climate (PSC) instrument into Dutch for this study. Scales were constructed based on the mean scores of related items. We also asked respondents to provide descriptive information (e.g. age, education and characteristics of their residents). The complete questionnaire is presented in the Appendix.

2.3.1. Challenging behaviours

Challenging behaviours were measured with the BPI-01 (Rojahn et al., 2001; Dumont et al., 2014), which is a validated instrument for the assessment of self-injurious ($\alpha = .817$), aggressive/destructive ($\alpha = .995$) and stereotypical ($\alpha = .909$) behaviour in residents with intellectual disabilities. Each respondent answered the questions on challenging behaviour for residents in their group home in order to measure how often they perceive challenging behaviours in their residents. The instruction was as follows: the next questions are on challenging behaviours which were displayed the last two months by your residents. Self-injurious behaviours consisted of 14 items, for example, frequency of self-biting or inserting objects in nose. Aggressive/destructive behaviours consisted of 10 items, for example, frequency of hitting others or bullying. Stereotypical behaviours consisted of 24 items, for example frequency of rocking as repetitive body movements or waving/shaking hands. Item responses are given on a five-point scale ranging from 'never' to 'every hour'. Higher mean scores indicate more frequent challenging behaviour.

Table 1. Ecological system aspects examined in this study, with mean scores.

Ecological system aspect	No. of items	Cronbach's α	Example item	Score
Microsystem: resident–staff member interaction				
Anxiety	4	.703	The quality of the staff member's work is influenced by the staff member's fear.	3.33 ± .747
Negative effects of restraint measures	2	N/A	The use of restraint measures can lead to the exacerbation of challenging behaviour.	3.34 ± .877
Providing stability	3	.569	At our location, residents regularly have to deal with substitutes they don't know.	3.48 ± .734
Central role of a primary staff member	6	.882	At our location, there is a strong mutual bond between a primary staff member and the resident.	4.05 ± .520
Positive resident–staff interaction	5	.828	At our location, staff members appreciate all residents.	4.00 ± .504
Sensitivity of staff members	4	.830	At our location, staff members listen to what the resident has to say or shows through behaviour.	3.86 ± .614
Constant awareness	3	.890	At our location, staff members constantly consider why they will do given things with the resident.	3.86 ± .614
Staying in contact with family	3	.674	At our location, relatives have contact with resident family members by phone, visits, etc.	3.16 ± .749
Involvement of family	3	.661	At our location, relatives are informed about changes in resident family member's care plan.	4.07 ± .542
Mesosystem: staff team				
Managing daily agitations	1	N/A	At our location, we work in a repressive/overcontrolling way.	2.78 ± 1.03
Staff members' network and power	3	.781	At our location, there is conflict between (groups of) staff members.	2.14 ± .761
Support of colleagues	5	.882	At our location, the decisions of colleagues are supported and well executed.	3.97 ± .547
Providing room for mistakes	5	.815	At our location, staff members feel safe when reporting mistakes.	4.04 ± .548
Staff's sense of safety	4	.899	At our location, we pay attention to the sense of safety of colleagues.	4.04 ± .655
Implementation of working methods	6	.787	At our location, staff members put (treatment/guidance) method(s) into practice.	3.75 ± .537
Performance monitoring	4	.864	At our location, goals are evaluated.	3.91 ± .540
Exosystem: organisational environment				
Staff turnover	1	N/A	At our location, there is a large amount of staff turnover.	3.06 ± 1.26
Understaffing	1	N/A	At our location, there is a shortage of staff.	3.14 ± 1.14
Allowing staff to explore	4	.897	At our location, the different competencies of staff members are used in the work we do.	3.77 ± .695
Finding a good match	3	.751	When hiring new staff members, we look at the match with the psychologist/manager supporting the location.	3.43 ± .846
Practice leadership – manager	11	.867	The manager at our location makes staff members aware of important common values and ideals.	3.79 ± .614
Psychologist's coaching of staff	11	.910	The psychologist at our location shows how you can view problems from different perspectives.	3.66 ± .735
Team context	4	.755	At our location, experts (doctors, occupational therapists, psychiatrists, etc.) give practical advice to staff members.	3.66 ± .735
Authentic leadership	3	.911	The Director/Board of Directors communicates and does what they say they are going to do.	3.84 ± .842
Mission statement	3	.771	A shared sense of cooperation on an important assignment/mission is fostered by the manager of the location.	3.72 ± .605
Vision guiding practice	4	.716	Everything we do within the organisation is in line with the organisation's vision.	3.72 ± .845
Grouping	1	N/A	Residents with challenging behaviours are placed in the same group homes as much as possible.	3.45 ± 1.05
Staff perceptions and attitudes toward residents' abilities and behaviour	4	.765	I believe that every resident can learn something.	4.24 ± .504
Control versus trust – participation	3	.844	I can influence decisions about my work.	3.95 ± .651
Control versus trust – proactive behaviour	4	.885	I look for ways to improve the work we do.	4.27 ± .480
Personnel policies in daily work	5	.885	It is clear to me what is expected of me in my work.	3.88 ± .681
Resident-friendly physical environment	3	.842	The interior of the location is resident- friendly.	3.76 ± .888
Need for extra financial means	6	.674	Is extra funding needed in the provision of support to residents with challenging behaviour for replacing materials?	4.08 ± 2.11
Macrosystem: society				
Disability policies	4	.785	I can apply governmental policies in daily practice.	3.50 ± .638
Deinstitutionalisation	1	N/A	My organisation is actively engaged in reverse integration and/or integration into the society or the neighbourhood.	3.40 ± 1.00
Media attention	1	N/A	Media coverage of residents with challenging behaviours is negative.	3.46 ± .766
Chronosystem: changes				
Service development based on changing views	7	.837	My work was influenced by the change in the type of support provided from takeover to activation.	3.46 ± .665

Scores are presented as means ± standard deviations.

2.3.2. Ecological systems

Table 1 provides an overview of the measures used to assess ecological system aspects. Item responses were given on a five-point scale ranging from 'not applicable' to 'fully applicable', or from 'fully disagree' to 'fully agree'. Higher mean scores indicate a more positive environment or, for the chronosystem, a greater influence of changing views. Cronbach's alpha values for the reliability of these scales ranged from .569 to .995.

Microsystem aspects (anxiety, positive resident–staff interactions, staff member sensitivity, constant awareness, the involvement of family members and staying in contact with family members) were measured using items from the work-environment scale of the LGWCI (Dekker et al., 2015; Neimeijer et al., 2018); friendly interpersonal behaviour, critical expressed emotion and proactive thinking scales of the SCIBI (Willems et al., 2010); and with items of the FPI instrument (Reid et al., 2007). Items on the negative effects of restraint measures, provision of stability and central role of a primary staff member were developed for this study (Velze et al., 2010). Mesosystem aspects (supporting your colleague, providing room for mistakes, staff's sense of safety, working method implementation and performance monitoring) were measured using items from the positive team functioning scale of the LGWCI, the non-punitive response to mistakes scale of the NHSPSC (Sorra et al., 2008; Castle et al., 2011), the organisational communication scale of the PSC instrument (Hall et al., 2010; Brondino et al., 2012; Bronkhorst, 2018) and the efficiency and goals scales of the QWC questionnaire (Arnetz, 1997; Arnetz et al., 2011). Items on the management of daily agitations and staff members' network and power were developed for this study. Exosystem aspects (allowing staff to explore, manager's practice leadership, psychologist's coaching of staff, team context, mission statement, vision guiding practice, staff perceptions and values regarding residents' abilities and behaviour, control versus trust – participation, control versus trust – proactive behaviour, and personnel policies in daily work) were measured with the competence development, participation, proactive behaviour, performance feedback and leadership scales of the QWC; items from the leadership, task significance, and shared vision and commitment scales of the LGWCI; and items from the CSAQ (Rose et al., 2006). Items on staff turnover, understaffing, finding a good match, authentic leadership, grouping, the living environment and (a greater need for) extra financial means were developed for this study. Response options for the latter items were 'yes' and 'no'. Items for the macrosystem aspects disability policies, deinstitutionalisation and media attention, and the chronosystem aspect service development based on changing views, were developed for this study.

2.4. Statistical analysis

The statistical analyses were performed with the SPSS software (version 26; IBM Corporation, Armonk, NY, USA). Descriptive statistics were used to explore ecological system aspects and outcome variables

(self-injurious, aggressive/destructive and stereotypical behaviours). The relationships between the organisational environment and challenging behaviours were examined with Pearson correlation analysis (Mackridge and Rowe, 2018). All ecological system aspects that correlated significantly ($p < .05$) with challenging behaviour were entered into a multivariate regression analysis, conducted with pairwise deletion of missing cases. We examined multilevel effects of the ecological system aspects that correlated significantly ($p < .05$) with challenging behaviour in the Pearson correlation, using a Mixed model with fixed effects conducted with listwise deletion of missing cases. We tested for the influence of the organisational level (level 2) on the outcome measures (self-injurious, aggressive/destructive and stereotypical behaviours). As the organisational level significantly affected self-injurious behaviour ($-2 \log$ likelihood 5289.570 vs. 5174.372; $p < .001$), aggressive/destructive behaviour ($-2 \log$ likelihood 5374.562 vs. 5279.230; $p < .001$) and stereotypical behaviour ($-2 \log$ likelihood 6181.950 vs. 6123.492; $p < .001$), we employed hierarchical regression analyses.

3. Results

Of 36 organisations invited to take part in this study, 21 ultimately participated. These organisations are situated in all regions of the Netherlands, and differ in size and histories. In total, 922 of 2543 care professionals and managers filled in the questionnaire (36% response rate). The majority of respondents were female (86%), worked about 20–32 and >32 h per week (50% and 46%, respectively) and had been employed by the organisations for about 4 years (69%). Respondents supported primarily residents with severe to profound intellectual disabilities and combinations of challenging behaviours (Table 2). Mean BPI-01 scores for self-injurious, aggressive/destructive and stereotypical behaviour were 16.21 ± 6.11 , 21.62 ± 7.24 and 32.52 ± 13.13 , respectively.

Mean scores for ecological system aspects are provided in Table 1. Table 3 shows correlations between these aspects and types of challenging behaviour, structured by ecological system level. At the microsystem level, the stability of resident–staff relationships and positive resident–staff interactions correlated with less self-injurious ($r = -.113$ and $-.097$, $p < .01$ and $<.05$), aggressive/destructive ($r = -.211$ and $-.147$, both $p < .001$) and stereotypical ($r = -.139$ and $-.097$, $p < .001$ and $<.05$) behaviour. The central role of a primary staff member in resident support correlated with less self-injurious ($r = -.092$) and aggressive/destructive ($r = -.089$) behaviour (both $p < .05$). The sensitivity of staff members correlated with less aggressive/destructive ($r = -.079$) and stereotypical ($r = -.086$) behaviour (both $p < .05$). Awareness of the negative effects of restraint measures was associated with less stereotypical behaviour ($r = -.075$, $p < .05$).

At the mesosystem level, a negative power balance in the staff network correlated with more self-injurious ($r = .177$), aggressive/destructive ($r = .209$) and stereotypical ($r = .185$) behaviour (all $p <$

Table 2. Percentages of respondents supporting different groups of residents.

Resident characteristic	Percentage of respondents supporting at least one such resident
Mild intellectual disability	56%
Moderate intellectual disability	56%
Severe to profound intellectual disability	80%
Physical aggression	86%
Destructive aggression	76%
Verbal aggression	86%
Self-injurious behaviour	54%
Sexually problematic behaviour	52%
Stereotypical behaviour	75%
Reactive challenging behaviour	62%
Criminal activity or addictive behaviour (societally challenging behaviour)	37%
Severe anxiety and apathy	67%

Table 3. Pearson correlations and regression associations between ecological system aspects and challenging behaviour of residents with intellectual disabilities.

Ecological system aspect	Self-injurious behaviour	Aggressive/destructive behaviour	Stereotypical behaviour
Regression constant (B)	11.31**	6.39	24.70**
Microsystem: resident-staff member interaction			
Anxiety	.019	.064	.066
Negative effects of restraint measures: hard on residents	-.061 (-.018)	.045 (.069)	-.075* (-.048)
Negative effects of restraint measures: challenge residents' behaviour	-.007	.033	-.007
Providing stability	-.113** (.023)	-.211*** (-.047)	-.139*** (-.013)
Central role of a primary staff member	-.092* (-.055)	-.089* (-.039)	-.072 (-.013)
Positive resident-staff interaction	-.097* (-.035)	-.147*** (-.129*)	-.097* (.008)
Sensitivity of staff members	-.055 (.139*)	-.079* (.150*)	-.086* (.043)
Constant awareness	.008	-.027	-.018
Staying in contact with family	.015	.021	.014
Involvement of family	.070	-.016	.055
Mesosystem: staff team			
Managing daily agitations	-.016	.025	-.002
Staff members' network and power	.177*** (.159**)	.209*** (.159**)	.185*** (.158**)
Support of colleagues	-.119** (-.022)	-.113** (.057)	-.125** (-.032)
Providing room for mistakes	-.091* (.044)	-.106** (.028)	-.092* (.046)
Staff's sense of safety	-.091* (.012)	-.086* (-.034)	-.083* (.033)
Implementation of working methods	-.119** (-.014)	-.139*** (-.018)	-.129** (-.022)
Performance monitoring	-.053	-.075	-.070
Exosystem: organisational environment			
Staff turnover	.117** (-.039)	.175*** (.038)	.143*** (.025)
Understaffing	.169*** (.108)	.181*** (.055)	.146*** (.040)
Allowing staff to explore	-.049	-.064	-.066
Finding a good match	-.145*** (-.105*)	-.076 (.002)	-.133** (-.088)
Practice leadership – manager	-.122** (-.001)	-.087* (.017)	-.108** (.004)
Psychologist's coaching of staff	-.065	.017	-.047
Team context	.053	-.035	.010
Authentic leadership	-.118** (.005)	-.123** (-.009)	-.110** (.004)
Mission statement	-.097	-.049	-.075
Vision guiding practice	-.048* (.018)	.018 (.036)	-.037 (.013)
Grouping	.085* (.074)	.230*** (.179)	.131** (.133)
Staff perceptions and attitudes toward residents' abilities and behaviour	.010	.049	.048
Control versus trust – participation	-.021	.003	-.031
Control versus trust – proactive behaviour	.051	.077	.077
Personnel policies in daily work	-.044	-.052	-.034
Resident-friendly physical environment	-.033	-.078	-.047
Need for extra financial means	.179*** (.116*)	.281*** (.186)	.137** (.043)
Macrosystem: society			
Disability policies	-.006	-.005	.013
Deinstitutionalisation	-.211*** (-.172***)	-.116** (-.114***)	-.182*** (-.162***)
Media attention	-.014	.032	.010
Chronosystem: changes			
Service development based on changing views	-.130** (-.054)	-.041 (-.023)	-.091* (-.019)
F	3.974***	6.027***	3.321***
Adjusted r^2	.092	.146	.073

Data are presented as r (β). * $p < .05$, ** $p < .01$, *** $p < .001$.

.001). Support of colleagues, staff's sense of safety and working method implementation (provision of support with clear goals and goal evaluation, and according to specific treatment methods) correlated with less self-injurious ($r = -.091$ to $-.119$, $p < .05$ to $.001$), aggressive/destructive ($r = -.086$ to $-.139$, $p < .05$ to $<.001$) and stereotypical ($r = -.083$ to $-.129$, $p < .05$ to $<.01$) behaviour. Providing room for mistakes correlated with less aggressive/destructive behaviour ($r = -.106$, $p < .01$).

At the exosystem level, understaffing, staff turnover, grouping of residents with challenging behaviour and the need for extra financial

means correlated with more self-injurious ($r = .085$ to $.179$, $p < .05$ to $<.001$), aggressive/destructive ($r = .175$ to $.281$, all $p < .001$) and stereotypical ($r = .131$ to $.146$, $p < .01$ to $<.001$) behaviour. Managers' practice leadership and authentic CEO leadership correlated with less self-injurious ($r = -.122$ and $-.118$, both $p < .01$), aggressive/destructive ($r = -.087$ and $-.123$, $p < .05$ and $<.01$) and stereotypical ($r = -.108$ and $-.110$, $p < .01$) behaviour. Good matching of staff, other professionals, managers and residents correlated with less self-injurious ($r = -.145$, $p < .001$) and stereotypical ($r = -.133$, $p < .01$) behaviour. Vision-based

Table 4. Multi level associations between ecological system aspects and challenging behaviour of residents with intellectual disabilities.

Ecological system aspect	Self-injurious behaviour	Aggressive/destructive behaviour	Stereotypical behaviour
Constant	14.31*** (3.94)	13.52** (4.47)	31.17*** (8.39)
Microsystem: resident–staff member interaction			
Negative effects of restraint measures: hard on residents	-.271 (.256)	.321 (.291)	-1.03 (.548)
Providing stability	-.080 (.478)	-.849 (.542)	-1.30 (1.02)
Central role of a primary staff member	-.365 (.573)	.028 (.653)	.369 (1.23)
Positive resident–staff interaction	-.366 (.717)	-2.16** (.817)	-.505 (1.54)
Sensitivity of staff members	.785 (.688)	2.19** (.783)	.569 (1.48)
Mesosystem: staff team			
Staff members' network and power	1.095** (.384)	1.68*** (.437)	2.39** (.819)
Support of colleagues	-.467 (.693)	.377 (.790)	-.647 (1.48)
Providing room for mistakes	.433 (.688)	-.013 (.784)	-.310 (1.13)
Staff's sense of safety	.041 (.527)	-.277 (.600)	-.083 (.033)
Implementation of working methods	-.933 (.662)	.637 (.754)	1.33 (1.41)
Exosystem: organisational environment			
Staff turnover	.569* (.275)	.316 (.312)	.405 (.587)
Understaffing	-.214 (.313)	.237 (.354)	.006 (.664)
Finding a good match	-.316 (.324)	.124 (.369)	-.529 (.694)
Practice leadership – manager	-.440 (.506)	-.120 (.576)	-.277 (1.08)
Authentic leadership	-.144 (.386)	-.022 (.440)	-.337 (.824)
Vision guiding practice	.129 (.625)	.650 (.711)	.936 (1.33)
Grouping	.181 (.287)	.634 (.326)	1.26* (.614)
Need for extra financial means	.406** (.132)	.588*** (.150)	.448 (.282)
Macrosystem: society			
Deinstitutionalisation	-.412 (.299)	-.789* (.339)	-.664 (.639)
Chronosystem: changes			
Service development based on changing views	-.572 (.411)	-.728 (.468)	-.640 (.878)

Data are presented as $\beta(S.E)$. * $p < .05$, ** $p < .01$, *** $p < .001$.

guidance of the staffs daily work practices correlated with less self-injurious behaviour ($r = -.097$, $p < .05$).

At the macrosystem level, community/societal integration (deinstitutionalisation) correlated with less self-injurious ($r = -.211$, $p < .001$), aggressive/destructive ($r = -.116$, $p < .01$) and stereotypical ($r = -.182$, $p < .001$) behaviour. At the chronosystem level, service development based on changing views correlated with less self-injurious ($r = -.130$, $p < .01$) and stereotypical ($r = -.091$, $p < .05$) behaviour.

The multivariate regression analysis revealed the following associations related to decreased challenging behaviour: positive resident–staff interaction with less aggressive/destructive behaviour ($\beta = -.129$, $p < .05$); sensitivity of staff members with less self-injurious ($\beta = .139$) and aggressive/destructive ($\beta = .150$) behaviour (both $p < .05$); good matching of staff, other professionals, managers and residents with less self-injurious behaviour ($\beta = -.105$, $p < .05$); and deinstitutionalisation with less self-injurious ($\beta = -.172$), aggressive/destructive ($\beta = -.114$) and stereotypical ($\beta = -.162$) behaviour (all $p < .001$). A negative power balance in the staff network was associated with more self-injurious ($\beta = .159$), aggressive/destructive ($\beta = .159$) and stereotypical ($\beta = .158$) behaviour (all $p < .01$), and a greater need for extra financial means was associated with more self-injurious behaviour ($\beta = .116$, $p < .05$; Table 3).

The multilevel analysis revealed the following significant estimates of fixed effects related to challenging behaviours (Table 4). Positive resident–staff interactions with less aggressive/destructive behaviours ($\beta = -2.16$, $p < .05$). Staff member sensitivity with more aggressive/destructive behaviours ($\beta = 2.19$, $p < .05$). Staff members' network and power with more self-injurious ($\beta = 1.09$, $p < .01$), aggressive/destructive ($\beta =$

1.68, $p < .001$) and stereotypical behaviours ($\beta = 2.39$, $p < .01$). Grouping with more stereotypical behaviours ($\beta = 1.26$, $p < .05$). Staff turnover with more self-injurious behaviours ($\beta = .569$, $p < .05$). Need for extra financial means with more self-injurious ($\beta = .406$, $p < .01$) and aggressive/destructive behaviours ($\beta = .588$, $p < .001$). Deinstitutionalisation with less aggressive/destructive behaviours ($\beta = -.789$, $p < .05$).

4. Discussion

This quantitative study showed that aspects of the organisational environment of support services for residents with intellectual disabilities at four ecological system levels (the micro-, meso-, exo- and macrosystems) play a role in residents' challenging behaviour, as perceived by care professionals and managers. In the multivariate analysis, no chronosystem-level aspect was related significantly to residents' challenging behaviour.

On the microsystem level, positive resident–staff interactions and the sensitivity of staff members were related to the challenging behaviour of residents. Positive and sensitive relationships between residents and staff members seem to be beneficial for residents' feelings of belonging and being valued, which reduces their loneliness and isolation and, thus, their challenging behaviour (Bigby et al., 2015; Ratti et al., 2016; Scheffelaar et al., 2018). Mansell and colleagues (2008) and Allen and colleagues (2013) add that constant extra training of care professionals is needed to truly provide resident focused support, and their previous professional education is the base for generalising newly learned skills in training into daily practices. However, higher sensitivity in staff seems to be

associated with more aggressive/destructive behaviours, it may be that staff who are more sensitive signal more challenging behaviours, but are also more able to manage these without a restrictive and controlling support style (Olivier-Pijpers et al., 2020).

On the mesosystem level, a proper power balance and staff network was linked to challenging behaviour. This finding is in line with the work of Gillett and Stenfort-Kroese (2003) and White et al. (2003), who found that negative power dynamics and power imbalances in staff teams and network play large roles in whether teams feature negative social pressure, resulting in inappropriate working relationships among staff members. These relationships negatively affect resident–staff interactions, influencing residents' challenging behaviour (Gillett and Stenfort-Kroese, 2003; White et al., 2003; Bigby et al., 2015). Our findings are partly in line with those of healthy workplace studies conducted in health organisations, which have shown that positive work climates and the prioritisation of clear goals and tasks in teams are essential for the prevention of staff stress and the enhancement of organisational efficacy in supporting residents, thereby diminishing incidents with challenging behaviours (Arnetz and Blomkvist, 2007; Lindberg and Vingard, 2012; Josefsson et al., 2018).

At the exosystem level, the organisational vision on grouping of residents with challenging behaviours with other residents with challenging behaviours in a group home is linked to challenging behaviours. White and colleagues (2003) add that residents in these groups are at greater risk of abuse by staff members. More homogeneous groups comprised only of residents with challenging behaviours seem to be supported by staffs that are less diverse and have lower educational levels, as staff members for these groups are difficult to find. In contrast, more heterogeneous groups seem to be supported by staffs who provide less and inefficient support because more time is spent planning and arranging individual residents' activities according to the person-centred approach (Felce et al., 2002; Mansell et al., 2008; White et al., 2003). Ratti and colleagues (2016) concluded in a systematic review that the effectiveness of person-centred planning is uncertain, as its implementation depends on changes in organisation members' attitudes, values and competencies, which is difficult, limiting challenging behaviour management by staff.

Also, on the exosystem level, staff turnover of direct staff members and need for extra financial means is associated with challenging behaviours. In addition to sufficient staff and financial resources, Bigby and Beadle-Brown (2018) emphasised the importance of proper front-line management and human resources policies and practices in order to provide guidance to staff to be able to enhance residents' quality of life, which in turn may influence their challenging behaviour (Josefsson et al., 2018; Deveau and McGill, 2019).

On the macrosystem level, deinstitutionalisation was associated with the reduction of residents' challenging behaviour. Graham et al. (2013) argued that the living of a normal life and engagement in society are crucial for residents with intellectual disabilities receiving support services. Residents' engagement in positive and respectful relationships and meaningful involvement with others in society may improve some domains of quality of life and diminish challenging behaviour, as seen in studies of positive behaviour support (Bigby and Beadle-Brown, 2018; McKenzie et al., 2018). Chowdhury and Benson (2011) stated that deinstitutionalisation should also entail changes in other domains of residents' quality of life, such as increased control in daily life (choice and autonomy) and in their financial and employment statuses (material well-being).

On the chronosystem level, support service development based on changing societal views was not linked to challenging behaviour. Changing views on people with intellectual disabilities are, for example, supported by the United Nations Convention on the Rights of People with Disabilities (The United Nations, 2006), which is legally binding and requires countries to promote, protect and ensure the rights of all persons with disabilities. Hamlin and Oakes (2008) stated that changing views, such as the shift in rights of people with disabilities and from a preference

for hospitalisation to deinstitutionalisation, are difficult to effect and to link to residents' challenging behaviour (Bigby et al., 2009). The restructuring of support service organisations based on changing societal views may not be related directly to challenging behaviour, but changes in discourse on aspects such as resident–staff relationships (emphasising the protection, power and humanity of residents) may influence these behaviours (Hamlin and Oakes, 2008).

4.1. Limitations

Several limitations of this study need to be acknowledged. First, the overall response rate was lower than expected, which could have biased our findings (Mutepefa and Tapera, 2019). Some respondents stated that their workloads and/or the prioritisation of other activities prevented them from completing the questionnaire. Thus, respondents who manage more frequent and severe challenging behaviours of residents may be underrepresented in our sample. In addition, most participants were staff members and psychologists; managers are underrepresented in our sample, which may have narrowed the scope of perspectives represented in our data. Second, all data were gathered using self-report questionnaires, which may have resulted in social desirable answers or difficulties in recalling of some of the aspects. Future studies should employ observational methods to explore aspects influencing residents' challenging behaviour in natural settings. Third, we did not use the BPI to assess a clinical level of challenging behaviours in residents, but used it to gather information on how often respondents perceive challenging behaviours in their residents. This may have limited our findings. Fourth, we only found weakly significant relationships of study variables with challenging behaviour, which may have resulted from the examination of a multitude of aspects, all of which may influence challenging behaviour alone and in interaction with each other. We recommend longitudinal examination of the relationships revealed in this study, these relationships may be dynamic and aspects may change over time. Fifth, further research on the perspectives of residents and their representatives regarding ecological system aspects in relation to residents' behaviours is recommended, as it would provide another perspective on the organisational environment. Furthermore, the combined analysis of different types of challenging behaviour may provide supplementary insight, as these behaviours are dependent on each other.

5. Conclusions

Using ecological theory, this quantitative study showed that organisational aspects at the micro-, meso-, exo- and macrosystem levels influence the challenging behaviour of residents with intellectual disabilities. Thus, proper prevention and management of the challenging behaviour of such residents requires the investigation of aspects at all system levels of the organisational environment, and interrelationships among them.

Declarations

Author contribution statement

V. Olivier-Pijpers: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

J. M. Cramm, A. P. Nieboer: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing interest statement

The authors declare no conflict of interest.

Additional information

Supplementary content related to this article has been published online at <https://doi.org/10.1016/j.heliyon.2020.e04751>.

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