

Original Research

Quality of the educational environment in postgraduate community pharmacy education and the relationship with trainees' basic psychological needs

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Abstract

Background: Quality of the educational environment affects trainee performance and well-being in postgraduate healthcare education. In pharmacy practice the quality of the educational environment has not been extensively studied. Self-determination Theory can assist in understanding the underlying mechanisms. **Objectives:** In this study, the quality of the educational environment and its relationship with satisfaction and frustration of trainees' basic psychological needs and motivation were investigated in a Dutch community pharmacy postgraduate education programme. **Methods:** In a cross-sectional study, pharmacists specializing to become community pharmacists completed the Scan of Postgraduate Educational Environment Domains (SPEED), the Basic Psychological Need Satisfaction and Frustration Scale for the Work Domain, and the Academic Motivation Scale. Confirmatory factor analysis followed by path analysis was used to analyse the relationships between the variables. **Results:** Out of 232 trainees, 205 responded (88%). Most trainees (82%) were positive about the quality of the educational environment. The resulting path model displayed a moderate to good fit. The perceived quality of the educational environment had a moderate positive association with basic psychological needs satisfaction (Factor loading = 0.40) and a similar negative association with basic psychological needs frustration (Factor loading = -0.47). Basic psychological needs frustration had a moderate association with an increased sense of internal and external pressures also known as controlled motivation (Factor loading = 0.31). Intrinsic motivation was not affected by the perceived quality of the educational environment. **Conclusions:** The educational environment was perceived as positive in most community pharmacies. However, having a less positive or a negative perception was associated with reduced satisfaction and increased frustration of trainees' basic needs for autonomy, competence and relatedness. Moreover, basic psychological needs frustration was associated with an increased perception of controlled motivation. We recommend supporting supervisors in creating a positive educational environment in pharmacy practice, thereby reducing the risk of basic psychological needs frustration and increased controlled motivation amongst trainees.

Keywords: postgraduate pharmacy education; self-determination theory; motivation; job satisfaction

INTRODUCTION

Owing to the rise of clinical pharmacy services, community pharmacy practice is becoming increasingly important as a clinical learning environment.¹⁻⁴ Trainees can demonstrate

relevant knowledge, skills, and behaviors in an authentic, contextually rich, learning environment and competencies can be assessed in a real world context.⁵⁻⁷ While from medical education it is known that trainee performance and well-being can significantly be affected by the quality of the educational environment, in pharmacy practice the quality of the educational environment has not been extensively studied.⁸⁻¹¹

Based on Moos' theory of human environments, the educational environment can be characterized by three dimensions: 1) a personal development dimension of the trainee, which relates to independence, task orientation, and work pressure, 2) a relationship dimension, which relates to the extent to which people are involved in the setting, support and help each other, and express themselves openly, and 3) a system maintenance and system change dimension, which relates to the extent to which the environment is orderly and clear in its expectations, maintains control and responds to change.¹² The quality of the educational environment has been found to be associated with preparedness for practice, work-related quality of life, job satisfaction, and personal accomplishment, but also negatively with stress and burnout.^{8,9,13-15}

Understanding the mechanisms through which the educational environment affects these outcomes can give valuable input for improvement of the quality of curricula.¹⁶ Self-determination Theory, a macrotheory of human motivation, describes three

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basic psychological needs (BPN), that influence trainees' cognitive, affective, and behavioural outcomes: autonomy, competence, and relatedness.¹⁷ The satisfaction of these BPN has been found to predict performance and well-being in the workplace, while frustrating or thwarting of BPN has been linked to negative outcomes.¹⁸ Autonomy refers to the individual's ability to act with a sense of ownership of their own behaviour and to feel free of pressure. Competence refers to the individual's ability to develop new skills that help to solve the issues with which the individual is confronted, and the individual's ability to develop mastery over tasks. Relatedness refers to the individual's sense of belonging in a relevant context and connectedness with others, in this case colleagues.¹⁸ It has been suggested that BPN satisfaction and BPN frustration are not simply each other's opposites and should be treated as independent variables.¹⁸

In this cross-sectional study, we investigated the quality of the educational environment in community pharmacies, as perceived by pharmacists specializing to become community pharmacists. In addition, the relationships between the quality of the educational environment, and the satisfaction and frustration of trainees BPN were investigated. The quality of motivation (autonomous versus controlled motivation) was included as a dependent variable as it has been recognized within Self-determination Theory as a mediator between BPN and students' performance and well-being.¹⁹⁻²¹

METHODS

We performed this study in the Netherlands. Pharmacists participated in a two-year workplace-based postgraduate education programme to become registered as a community pharmacy specialist.⁷ Annually, 100 to 140 trainees enter the programme. The community pharmacies need to be officially approved by a Specialist Registration Committee to become registered as a teaching pharmacy.²² Commonly, a teaching pharmacy accommodates one trainee. The trainee is employed by the pharmacy during the two-year programme. The supervisor has to complete a two-day supervisor training prior to supervising.

Scan of postgraduate educational environment domains

Multiple instruments have been developed in medical education to measure the quality of the educational environment as perceived by trainees, such as the Dutch residency educational climate test (D-rect), the postgraduate hospital educational environment measure (PHEEM), the Dundee ready education environment measure DREEM, and the Scan of Postgraduate Educational Environment Domains (SPEED).^{14,23-26} In this study, we used the SPEED, as it is especially designed for postgraduate education, concise, and based on Moos' theory of human environments.²⁵ The SPEED measures three subdomains (five items each) of the educational environment: Content (personal development dimension), Atmosphere (relationship dimension), and Organization (system maintenance dimension). The participants were asked to rate 15 statements on a five-point Likert scale (1: completely disagree, 5: completely agree). We classified the overall quality of the educational environment

as negative (mean score: < 2.5), neutral (mean score: 2.5 - 3.5), or positive (mean score: > 3.5).

Basic psychological need satisfaction and frustration scale

A Dutch version of the Basic Psychological Need Satisfaction and Frustration Scale for the Work Domain was used to measure both the satisfaction and frustration of the BPN of trainees.^{27,28} The questionnaire consists of 24 items, four items for each of the 6 subdomains: autonomy satisfaction, competence satisfaction, relatedness satisfaction, autonomy frustration, competence frustration, and relatedness frustration. Participants were asked to indicate on a five-point Likert scale (1: strongly disagree, 5: strongly agree) how much they agreed with each of the statements based on their personal experiences in the previous four weeks.

Academic motivation scale

Motivation was measured with a Dutch version of the Academic Motivation Scale.^{29, 30} Self-determination Theory describes motivation as a continuum ranging from non-self-determined to fully self-determined, but in research a dichotomous classification is often used.¹⁷ Autonomous motivation, derived from genuine interest and personal endorsement in a given task or activity was calculated by combining the scores of the three subtypes of intrinsic motivation with the state of identified regulation. Controlled motivation, derived from internal or external pressures and expectation of rewards was calculated by combining the scores of introjected regulation and external regulation.²¹ Amotivation, which refers to the absence of motivation for an activity, was excluded from the questionnaire, because previous research has shown that amotivation is not an area of concern in health professions education.²⁹ There were four items for each of the six subscales, resulting in 24 total items. Participants were asked to indicate (using a five-point Likert scale, 1: does not correspond, 5: exactly corresponds) to what extent each of the included items corresponded to their motivation for participating in the educational programme.

Procedure

The wording of the three questionnaires was adapted to the community pharmacists' training context by the primary researcher and checked by a second researcher for appropriateness. The questionnaires were piloted with two trainees to check if the wording was clear. After data collection, one item from the subscale: 'motivation towards accomplishment' of the Academic Motivation Scale, had to be removed due to inaccurate wording, leaving 62 total items for the data analyses.

Between November 2017 and October 2018, 232 trainees, who had at least been in training for three months, were approached to participate in this study. Questionnaires were administered during monthly classroom courses. Written informed consent was obtained from all the participants. Ethical approval was granted by the Netherlands Medical Education Association.

Data analysis

Given the sample size of our data and the number of parameters involved, we used a two-step factor path analysis, as proposed



by Violato and Hecker (2007) to analyse the relationships between educational environment, BPN satisfaction and frustration, and motivation.^{29,31,32} In the first step, the reliability and construct validity of measuring the latent variables with the given subscales was analysed using SPSS, version 24 (IBM Corp., Armonk, New York) and Mplus, version 8 (Muthén and Muthén, Los Angeles, California). Measurements with subscales that showed poor reliability (Cronbach's alpha < 0.65) or poor construct validity (Confirmatory Factor Analysis) were excluded before further analyses. The correlations between the latent variables were investigated by computing Pearson correlations with SPSS.

In the second step, a path analysis was used to test the hypothesized model shown in figure 1. Based on previous studies in undergraduate education we expected a positive association of the educational environment with trainees' BPN satisfaction.^{33,34} Correspondingly, we expected a negative correlation between the quality of the educational environment and trainees' BPN frustration.^{18,35} Autonomous motivation, derived from genuine interest and personal endorsement in a given task or activity, was expected to be positively associated with a higher satisfaction of trainees' BPN.¹⁸ Controlled motivation, derived from internal or external pressures and expectation of rewards, was expected to be positively associated with a higher frustration of trainees' BPN.²⁹ Factor loadings and fit indices were calculated using MPlus 8.³¹ For both steps, we looked at the following indices to estimate model fit: Chi-square (Chi² / degrees of freedom (N), and P-value), the Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square Residual (SRMR), the Comparison of Fit Index (CFI), and the Tucker-Lewis index (TLI).³⁶ With a sample size lower than 250, we used the following indices and cut-off criteria for: good model fit (SRMR < 0.08 and CFI > 0.95), moderate model fit (SRMR 0.08 < > 0.10 and/or CFI 0.90 < > 0.95), and poor model fit (SRMR > 0.10 and/or CFI < 0.90).³⁶

Results

We had a response rate of 88% (205 out of 232 approached trainees), out of which 148 (72%) were female (representative for the gender distribution in the trainee population).

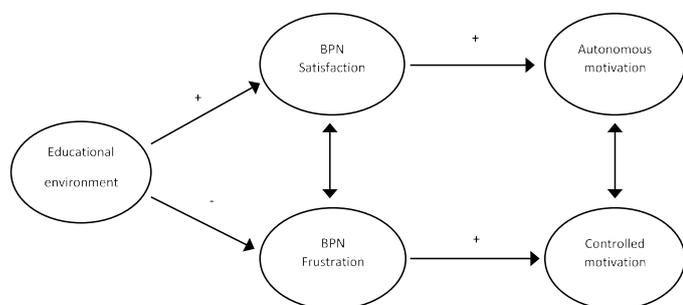


Figure 1. Hypothesized model of the relationships between the perceived quality of the educational environment, basic psychological needs (BPN) satisfaction and frustration, and autonomous and controlled motivation

The educational environment

Table 1 shows the outcomes for the 15 items of the SPEED. Scores ranged from 1 to 5 for each of the items. Trainees were most satisfied with the atmosphere subdomain, with the highest scores for item 6 (the supervisor(s) is/are approachable and helpful) and item 10 (the supervisors are respectful towards trainees). Trainees were least satisfied with the organization subdomain, with the lowest scores for item 11 (teaching and learning are emphasized in this pharmacy) and item 15 (my supervisor prevents me from having to perform too many tasks irrelevant to my learning). Overall, 8 trainees (4%) perceived the quality of the educational environment as negative, 28 trainees (14%) as neutral, and 169 (82%) as positive.

Reliability and construct validity of subscales

Measurements with all subscales for the SPEED, the Basic Psychological Need Satisfaction and Frustration Scale, and the Academic Motivation Scale had a moderate to good reliability based on internal consistency (Cronbach's alpha 0.66–0.85) and confirmatory factor analysis fit, except for the measurement of identified regulation within the Academic Motivation Scale (Cronbach's alpha 0.606, SRMR 0.094, CFI 0.667). We excluded this subscale from further analysis. As the measurement of identified regulation is needed to calculate autonomous motivation, we decided to use intrinsic motivation as a latent variable instead in further analyses.¹⁸

Latent variables score and correlations

Table 2 shows the mean score, standard deviation and fit indices for the latent variables: educational environment, BPN satisfaction and frustration, intrinsic motivation, and controlled motivation. On average trainees felt that their BPN were satisfied at the community pharmacy, and frustration of their BPN was low. Intrinsic motivation of the trainees was high, and controlled motivation was moderate. However, standard deviations show large inter-individual variations between trainees, especially for the educational environment, intrinsic motivation and extrinsic motivation. Confirmatory Factor Analysis produced a moderate to good fit for each of the latent variables making them suitable for the path analysis.

Table 3 shows the Pearson correlations between the scores of the latent variables. The perceived quality of the educational environment correlated positively with BPN satisfaction and negatively with BPN frustration, but not directly with intrinsic motivation and controlled motivation. BPN satisfaction correlated negatively with BPN frustration. Controlled motivation was positively correlated with both BPN frustration and intrinsic motivation.

Path analysis

Figure 2 shows the results of the path analysis. The CFI (= 0.96), and SRMR (= 0.044) indicated a good fit for the tested model. The TLI (= 0.90) and the RMSEA (= 0.12) indicated a poorer fit, but were not eligible as cut-off criteria, as the sample size was below 250.³⁶ Examination of possible improvements of model fit using subscale items and alternative relationships between the latent variables did not lead to model improvements, which led us to accept the model shown.

Item	Mode	Mean (SD*)	Cronbach's alpha
SPEED	-	3.88 (0.61)	-
Subdomain: content	-	3.95 (0.64)	0.809
1. The feedback provided by my supervisor is focused on my strengths and area's for improvement.	4	3.81 (0.90)	-
2. The progress evaluations are useful discussions about my performance.	4	3.75 (0.84)	-
3. My supervisor(s) is/are all in their own way positive role models.	4	3.93 (0.89)	-
4. The level of autonomy given to me is appropriate to my level of training.	4	4.20 (0.84)	-
5. The training in this training pharmacy prepares me for my future career as a community pharmacy specialist.	4	4.05 (0.80)	-
Subdomain: atmosphere	-	4.16 (0.68)	0.831
6. The supervisor(s) is/are approachable and helpful.	5	4.33 (0.80)	-
7. Supervisor(s), pharmacy team, other (paramedic) personnel, and trainee work together as a team here.	4	4.06 (0.86)	-
8. There are NO supervisors who have a negative impact on the educational climate.	4	3.97 (1.04)	-
9. My supervisor supports me in difficult situations.	4	4.04 (0.88)	-
10. The supervisors are respectful towards trainees.	5	4.39 (0.78)	-
Subdomain: organization	-	3.52 (0.70)	0.814
11. Teaching and learning are emphasized in this pharmacy.	3	3.24 (0.89)	-
12. Good (clinical) supervision is available at all times.	4	3.65 (0.90)	-
13. My supervisor is clear about my duties and responsibilities.	4	3.75 (0.88)	-
14. My supervisor reserves time to supervise/counsel me.	4	3.67 (0.96)	-
15. My supervisor prevents me from having to perform too many tasks irrelevant to my learning.	3	3.28 (0.97)	-

*SD = Standard deviation

Latent variable (scale)	Mean (SD), Range	Chi ² /N, P-value	RMSEA	SRMR	CFI	TLI
Educational environment* (1-5)	3.88 (0.61), 1.27 – 4.87	1.8, <0.001	0.064	0.048	0.950	0.939
BPN Satisfaction † (1-5)	3.81 (0.43), 2.17 – 5.00	2.3, <0.001	0.079	0.066	0.911	0.885
BPN Frustration* (1-5)	2.26 (0.57), 1.08 – 4.27	1.3, 0.092	0.036	0.039	0.984	0.980
Intrinsic motivation † (1-5)	3.60 (0.72), 1.09 – 5.00	2.6, <0.001	0.088	0.044	0.942	0.922
Controlled motivation (1-5)	2.95 (0.85), 1.00 – 5.00	- **	- **	- **	- **	- **

BPN = basic psychological needs, * good model fit, † moderate model fit. See Materials and methods section for the cut-off criteria used. ** Fit indices could not be calculated with 2 subdomains. However, both subdomains showed good reliability and construct validity.

Latent variables	Educational environment	BPN Satisfaction	BPN Frustration	Intrinsic motivation	Controlled motivation
Educational environment	1				
BPN Satisfaction	0.570 (< 0.01)	1			
BPN Frustration	-0.508 (< 0.01)	-0.703 (< 0.01)	1		
Intrinsic motivation	-0.027 (0.698)	0.136 (0.052)	0.055 (0.433)	1	
Controlled motivation	-0.131 (0.063)	-0.051 (0.472)	0.255 (< 0.01)	0.418 (< 0.01)	1

BPN = basic psychological needs, Pearson Correlation (P-value).



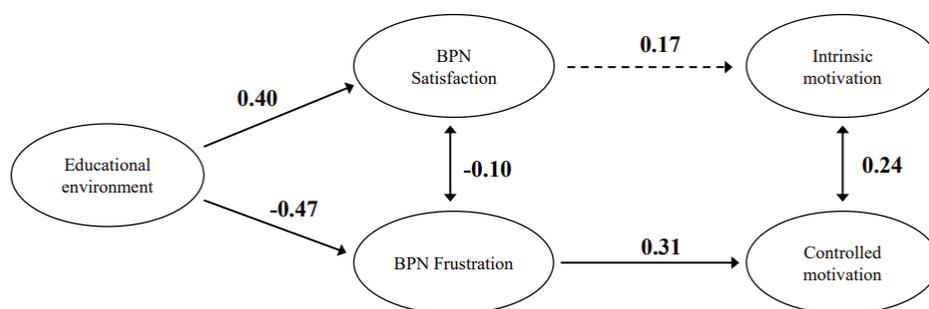


Figure 2. Structural Equation Model of the relationships found between trainees perceived Educational Environment, the satisfaction and frustration of their basic psychological needs (BPN), and their intrinsic and controlled motivation. A continuous line represents a statistically significant relation ($P < 0.05$), a dotted line represents a nonsignificant relation. Factor loadings are indicated. Fit Indices: Chi-Square ($\chi^2 = 15.507$, degrees of freedom $N = 4$, $P = 0.003$), RMSEA ($= 0.12$), SRMR ($= 0.044$), CFI ($= 0.96$), and TLI ($= 0.90$)

Discussion

We measured the quality of the educational environment in community pharmacies as perceived by trainees using an adapted version of the SPEED. Measurements had a good reliability based on internal consistency, confirmatory factor analysis showed a good model fit, and scores given by trainees ranged from the floor to the ceiling of the 5-point Likert scale. Previously, the SPEED has shown good internal consistency and reliability of measuring the quality of the educational environment in a rural general practice setting.³⁷ In both settings, scores were highest for supervisors being respectful, approachable and helpful. Similarly, preventing trainees from having to perform too many tasks irrelevant to their learnings was amongst the lowest scores in both the Dutch community pharmacy (this study) and the Australian rural general practice setting. In our study, the majority of trainees was positive about educational environment (82%) in community pharmacies. However, there still appears to be room for improvement, as in almost one fifth of the pharmacies the educational environment was perceived as neutral or negative. Bachir et al, studied the educational environment in six private-sector pharmacy institutes in an undergraduate Pharm. D. program in Pakistan using the Dundee Ready Education Measure (DREEM).^{26,38} In that study, most students had a positive perception of the educational environment, but the environment of some institutes scored significantly better than of other institutes.

When we look at the impact the educational environment has on trainees, our results support Self-determination Theory's claim that a good quality educational environment, which is supportive, positively affects the satisfaction of BPN, and that a perceived absence of environmental support leads to frustration of BPN.^{17,18} We found a moderate positive association of the perceived quality of the educational environment with the BPN satisfaction, comparable to what was found in an undergraduate setting.^{33,34} We found a moderate negative association of the perceived quality of the educational environment with BPN frustration, which was not studied before in this context. Our results suggest that the negative

Pearson correlation we found between BPN satisfaction and BPN frustration of trainees, could be explained by the effect of the educational environment on each of the latent variables. This supports the suggestion by Van den Broeck *et al* that BPN satisfaction and frustration should be treated as independent variables.¹⁸

As hypothesized, we found in our model that a lower perceived quality of the educational environment was indirectly associated with higher controlled motivation, through the frustration of trainees' BPN. This finding shows the importance of not frustrating the needs for autonomy, competence and relatedness of trainees in the postgraduate workplace-based setting, as high controlled motivation has been associated with a broad variety of undesirable outcomes.³⁹ Moreover, a study by Tjin a Tsoi *et al* previously showed that a higher BPN frustration amongst pharmacists is directly and negatively related to their reported vitality.²⁹

In our study, the reliability and validity for measuring identified regulation was poor. The measurement of identified regulation with the Academic Motivation Scale, has been found to perform unsatisfactory before, and it has been suggested that this could be due to overlap between some of the items of the different subscales.^{40,41} We used intrinsic motivation instead of autonomous motivation in our model.^{29,32} We found no significant direct or indirect association between BPN satisfaction and intrinsic motivation, in contrast to previous findings.¹⁸ Therefore, based on our findings, we cannot claim that a higher perceived quality of the educational environment affects intrinsic motivation. A possible explanation is that the intrinsic motivation, as it is derived out of personal interest, is less context dependent than controlled motivation, which is driven by external factors.

Tempksi *et al* has suggested that the level of resilience and quality of motivation trainees have prior to the start of an educational programme, may impact the way they perceive the educational environment.⁴² Although we cannot rule out such an effect, studies examining the influences of personal



motivation on the perception of autonomy-supportive and controlling teaching environment suggest that these effects are limited.^{43,44}

Strength and limitations

This study was performed with pharmacists participating in a postgraduate workplace-based two-year specialization programme in a community pharmacy setting. A strength of this study is the high response rate (88%) which resulted in a near to complete view of the experience of pharmacists specializing to become community pharmacists in the Netherlands. However, studies in other pharmacy settings are needed to confirm these findings.

A baseline value of the motivation (and resilience) of trainees was not measured prior to the start of the education programme. Therefore, we cannot rule out any moderating effects these variable(s) could have had on the perceived quality of the educational environment. Also, we did not include outcome variables like performance and well-being in this study.

Implications for practice

Considering that research has shown that BPN satisfaction and BPN frustration are related to the performance and well-being of trainees, our findings underline the importance of having a positive educational environment, thus satisfying the needs for autonomy, competence, and relatedness of trainees at the site of training.²⁹ Preventing frustration of the BPN could be more important than improving the satisfaction of these needs, due to the association of BPN frustration with controlled motivation.²⁹ We recommend supervisor training to emphasize the importance of creating a positive learning environment for their trainees, and to supply supervisors with the tools to support the BPN of trainees. The workplace ideally should be a place where trainees can act autonomously, where feedback is constructive and where work pressure does not hamper educational goals. The atmosphere should be supportive and stimulating, with colleagues who express genuine interest in each other's personal orientations. The organization should have educational tasks and goals clearly defined, scaffold learning for all employees, and be responsive to change.^{33,45} Recent findings suggest that appointing a coach and having a peer social media group can be valuable components in creating additional support.⁴⁶

Conclusions

This study in community pharmacies in the Netherlands showed that most pharmacists specializing to become community pharmacists were positive about the quality of the educational environment. However, having a less positive or even negative perception was associated with reduced satisfaction and increased frustration of their basic needs for autonomy, competence and relatedness, in accordance with the Self-determination Theory. Subsequently, frustration of trainees' basic psychological needs was associated with an increase in the less desirable controlled motivation. Therefore, supporting a positive educational environment in workplace-based pharmacy education is recommended.

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CONTRIBUTORS

MW planned the study in discussion with AK, MB and RK. MW performed the data collection. MW, AK and SB performed the data analysis and primary interpretation of the results. All authors contributed to the discussion and critically revised subsequent drafts of the manuscript. All authors approved the final version of the manuscript. MW submitted the manuscript. RK is responsible for the overall content of the article as guarantor.

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COMPETING INTERESTS

The authors declare no conflicts of interest

ETHICS APPROVAL

Ethical approval has been granted by the NVMO Ethical Review Board. Date of Decision: 18-09-2017. NERB dossier number: 930.

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