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Influence of Trainees' Transfer Beliefs, Intentions, and Commitment on Transfer Readiness: Variable and Person-Oriented Analyses

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ABSTRACT

Transfer beliefs are understudied in the training transfer field, whereas structural equation modelling (SEM) has been a widely used technique to study transfer models. New methodologies are needed to study training transfer and network analysis (NA) has emerged as a new approach that provides a visual representation of a given network. We explored the relation of transfer beliefs, intentions, commitment, and implementation intentions, and transfer using variable (SEM) and person-oriented approaches (NA) according to groups of trainees based on their transfer readiness. The longitudinal design measured T1 before the training and T2 after the training (268 participants). T1 measured trainees' beliefs about transfer, commitment to transfer, and intention to transfer; T2 measured self-reported transfer and implementation intention actions. The results of the NA confirmed the structure of the exploratory factor analysis. The NA model offered the visual representation of the network complimentary to the results obtained via SEM. Differentiating NA and SEM multigroup by cluster showed differences in models and architectures between clusters. We discussed the relations between beliefs and transfer, and also the implications of the combined use of the SEM and NA as novel approaches to study transfer.

1 | Introduction

Baldwin and Ford's (1988) first comprehensive review and proposed model have influenced the research carried out in the area with its study of transfer and the factors that affect transfer, which were classified into the three classic categories: trainee, training and work environment factors. The publication of the model established the base for the latter research (Bhat et al. 2022) and drew a line for researchers in training transfer which adopted a variable-oriented approach.

Besides the successful advancements in what we know about the factors that influence transfer (Ford et al. 2018) from a variable-oriented perspective, several authors have highlighted the need for new methodologies (Schoeb et al. 2020) to study transfer which might adopt a person-oriented approach (De Jong et al. 2023). Additionally, research in the area has been traditionally cross-sectional, and there is a need to study from the lens offered by assorted designs that provide the opportunity to study transfer longitudinally (Schoeb et al. 2020).

In 2014, Quesada-Pallarès proposed the Unified Model of Motivation for Training Transfer (MTT), which adopted a person-oriented approach and described motivational processes in training transfer, expanded on attitudes towards transfer, and included understudied factors (Quesada-Pallarès and Gegenfurtner 2015). The model included, amongst others, trainees' beliefs, commitment to transfer, intention to transfer, and implementation intentions as precedents to the action phase (the transfer phase).

Based on the model, the author studied the transfer levels (high, medium, and low) through cluster analysis and analysed the relation of transfer intention factors based on the transfer readiness (Quesada-Pallarès et al. 2022). Transfer readiness reflects an individual's preparedness, encompassing both cognitive beliefs and motivational factors, to apply training effectively in their work environment (Ben Mansour et al. 2017). However, to our knowledge, no published work has studied the influence of most of the factors of the pre-action phases of transfer (beliefs, commitment to transfer, intention to transfer, and implementation intentions) from the Unified Model of Motivation for Training Transfer (Quesada-Pallarès and Gegenfurtner 2015).

2 | Purpose and Research Questions

Our purpose was to explore the relation of transfer beliefs, commitment to transfer, intention to transfer, and implementation intentions and transfer, and do so through the application of a longitudinal design and a combination of traditional (EFA and SEM) and new methodologies (NA) through a variable and person-oriented approach. Therefore, we wonder (RQ1) what kind of trainees' beliefs will ensure higher transfer readiness? (RQ2) What is the influence of trainees' beliefs, commitment and transfer intention on transfer? and (RQ3) What is the role of implementation intentions actions on this model?

2.1 | Theoretical Background and State of Research

2.1.1 | Unified Model of Motivation for Training Transfer (MTT)

The MTT is a model proposed to understand the behaviour change after the training (Quesada-Pallarès and Gegenfurtner 2015). The model was based on classic motivational theories and depicts three pre-action phases: (1) developing transfer intentions impacted by attitudes, norms, and perceived transfer control; (2) actualizing implementation intentions for transfer; and (3) reinforcing transfer commitment. Figure 1 shows the proposed model.

Within the variables included in the model as precedents of transfer, we described the ones included in this study (transfer beliefs, commitment to transfer, intention to transfer, and implementation intentions).

2.1.1.1 | Intention to Transfer (ITR). The intention to transfer is formed by attitudes towards transfer, subjective norms towards transfer, and perceived transfer control (Quesada-Pallarès et al. 2022). According to Quesada-Pallarès and Gegenfurtner (2015), trainees' attitudes about transfer are influenced by cognitive, affective, and behavioural factors (e.g. beliefs, feelings, and habits or customs). The social pressure trainees experience during transfer is referred to as subjective norms towards transfer (Wallace et al. 2005). Based on

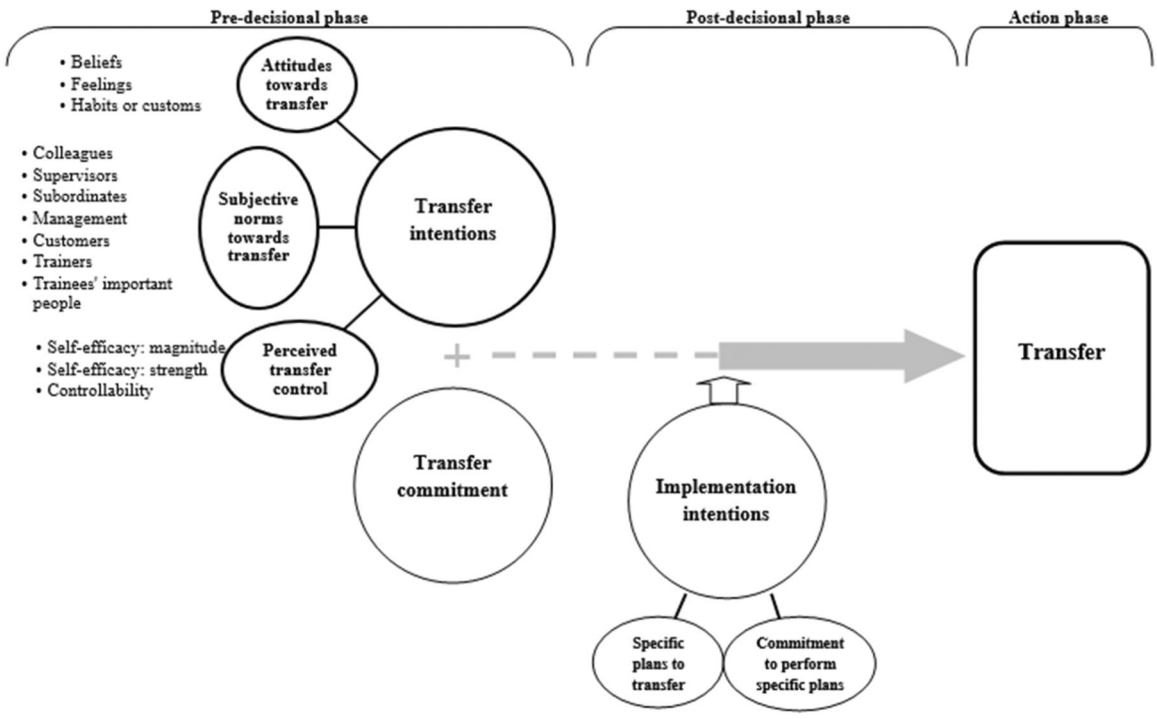

FIGURE 1 | Unified model of motivation for training transfer (MTT) (Quesada-Pallarès and Gegenfurtner 2015, p. 115).

Quesada-Pallarès and Gegenfurtner (2015), there are seven sources of normative influence on an employee: peers and coworkers, managers, supervisors, subordinates, clients (also known as customers or consumers), the trainer, and other pertinent individuals.

Trainees' perceived difficulty in navigating the transfer, overcoming impediments or barriers, and exerting control over the transfer are all components of their perceived behavioural control. Also, research has produced consistent results when utilizing self-efficacy to predict transfer across various training environments (Gegenfurtner et al. 2014).

Fishbein and Ajzen (1975) defined beliefs as an individual's estimation of the subjective probability of the wonder that an assumption is true. Thus, an individual's perception of being wrong or right about a fact or an assumption might determine the type of attitude that person will have regarding the object of study.

For MTT model, beliefs are a part of the attitudes towards transfer, which are determined by cognitive, affective, and behavioural elements (Quesada-Pallarès and Gegenfurtner 2015). Cognitive psychology highlights the unique influence of beliefs on behaviour. The Ellis ABC(DE) model (1991) shows that beliefs affect emotional, behavioural, and cognitive aspects. Cognitive psychologists, therefore, work on changing clients' limiting beliefs to foster more rational beliefs and behaviours. This approach is also applied in coaching, where modifying beliefs is seen as essential for behaviour change (Fisher-Yoshida and Yoshida 2022). Additionally, beliefs are crucial in health as they predispose individuals towards motivational changes in health behaviour (Green and Kreuter 2005).

In educational research, the interplay of beliefs and training, particularly through the knowledge, belief, commitment, and planning (KBCP) framework, is explored to enhance learning by fostering learners' self-regulation of effective strategies (McDaniel and Einstein 2020). This framework posits that integrating beliefs into training is crucial for achieving successful training transfer. Self-efficacy, recognized as a belief in one's ability to achieve specific performance levels, significantly impacts events in individuals' lives and learning transfer (Bandura 2004; Tran Huy and Dinh 2022). It is featured in various training transfer models, like Baldwin and Ford's (1988), adapted by Noe (2002), and has been linked to transfer outcomes in studies, including quantitative research (e.g., Ludwikowska 2021; Miiro et al. 2023).

Although there's limited research on the connection between beliefs and training transfer, a crucial aspect of lifelong learning, a study in Nepal investigated how cultural beliefs and other factors influenced learning transfer, considering the views of stakeholders like managers, supervisors, and employees (Subedi. 2006). These factors encompassed defining ideal training, its value, selecting employees for it, and the motivations for training. Another study indicated that beliefs about instrumentality/utility and self-efficacy were significant predictors of training implementation behaviours (Quratulain et al. 2021). Furthermore, Choi and Roulston (2015) discovered that health professionals' beliefs and values played a crucial role in how they transfer.

2.1.1.2 | Commitment to Transfer (CTR). Transfer commitment measures trainees' commitment to transfer intentions, a necessary antecedent to achieve transfer (Gegenfurtner 2013; Pineda-Herrero et al. 2014). It explores the importance given by the trainee to the transfer process, and it plays a crucial role in both phases of the model (Heckhausen and Gollwitzer 1987). During the pre-decisional phase, the individual dedicates themselves to specific behavioural intentions aimed at achieving the desired action (transfer); whereas in the post-decisional phase, commitment translates into actionable plans to guarantee successful implementation.

2.1.1.3 | Implementation Intentions (IMI). The model made a distinction between behavioural intentions: intention to transfer (pre-decisional phase) and implementation intentions (post-decisional phase). Implementation intentions referred to the latter and were constituted by the preparation and execution of the action plans by the trainees. These plans come before the action (Heckhausen and Gollwitzer 1987). The dedication of the trainee to conduct the specific plans is key because it creates a connection between the plans and the actions, and it is needed to guarantee that the plans are executed (Rise et al. 2003). The goal of this stage is to accomplish the desired outcomes: it encompasses the tasks completed by trainees with a transfer-focused mind-set.

2.1.1.4 | Training Transfer. Training transfer refers to how trainees apply the knowledge and skills acquired during the training in the work context (Quesada-Pallarès et al. 2022). A common framework in the transfer of training is the model developed by Baldwin and Ford (1988). This model suggested that training transfer is influenced by training inputs trainee characteristics, training design and work environment, training outputs acquisition of knowledge and skills during training, e.g. learning and conditions to transfer based on knowledge generalization, which refers to the initial application of newly acquired skills and maintenance, which reflects a continued implementation of training content over time (Baldwin and Ford 1988; Blume et al. 2019; González-Ortiz de Zárate et al. 2017; Quesada-Pallarès 2014).

Literature on training transfer is vast; in fact, there is much evidence that design-related factors and environmental factors are predictors of the transfer of training (Ford et al. 2018). Still, there is an evidence gap in proving that individual factors (or person-oriented factors) can be significant predictors of transfer of training using longitudinal designs (Pham et al. 2023). For instance, various studies have explored trainee characteristics and individual factors, including cognitive ability, locus of control, and motivation (Velada et al. 2007; Bell et al. 2017; Sahoo and Mishra 2019). However, there remains a significant gap in research regarding how these factors predict the timing of training transfer after the completion of the training (Ford et al. 2018). Additionally, theories of human behaviour (Ajzen 1985; Bandura 1986; Gollwitzer 1993) have been applied in the context of training transfer, as seen in studies like Gegenfurtner and Vauras (2012), Huang et al. (2015), and Reinhold et al. (2018). Nevertheless, their application has primarily centred on the motivational perspective of the individual without measuring the timing of training transfer post-training (Gegenfurtner 2011). Overall, it is evident that exploring

individuals' attitudes towards training transfer and their impact on transfer behaviour is an understudied topic.

2.1.2 | New Methodologies to Study Transfer

This research proposed using a combination of traditional (exploratory factor analysis [EFA] and structural equation modelling [SEM]) and new methodologies (network analysis [NA]) through a variable and person-oriented approach.

As a variable-oriented approach, we used SEM based on Bhat et al.'s (2022) recommendation. This was a traditional methodology that allowed us to explore the direct and indirect relationships amongst variables that influence training transfer, incorporating both latent and observed variables. The technique applies multiple tests, such as confirmatory factor analysis, path analysis, and correlation analysis (Jeon 2015); it allows for obtaining valuable information through nonexperimental studies and the investigation of causal relationships through nonexperimental designs (Herpertz et al. 2016; Jeon 2015; Tho and Trang 2015).

As a person-oriented approach, we used NA as an innovative approach to gain a comprehensive understanding of human behaviour. Considering that transfer beliefs are not isolated but rather interconnected, we could think of them as networks of complex and causally related systems. They can be thought of as dynamic and ever-evolving belief systems that influence and shape one another. Thus, NA is a powerful tool that allows the representation of variables as nodes and their connections as edges, exposing the interplay between various aspects of the systems (Borsboom 2022; Hevey 2018). The use of different approaches will foster a deeper understanding of training transfer, while advancing in the field.

3 | Materials and Methods

3.1 | Design

Our research utilized a quantitative, positivist approach with a nonexperimental, longitudinal design, comprising two phases: 3 days before training (T1) and 3 months post-training (T2). This nonexperimental method involved assessing training and its transfer without altering training procedures or conditions. The data for this study was derived from the doctoral thesis of Quesada-Pallarès (2014), which included various samples and additional variables; one of the samples is used for the first time in this manuscript. We adhered to the EU General Data Protection Regulation (Regulation [EU] 2016/679) for personal data protection and data movement.

3.2 | Participants

Online questionnaires were sent using a nonprobabilistic and intentional sampling technique. We contacted three organizations (two of them public organizations) and asked them about the possibility of doing research with some of their employees who were about to start a training activity within a month. Indeed, training activities consisted of 26 courses. Organizations classified the courses into four categories: hard skills (37%; like *General Legal Norms Regarding Funding*), technological skills (34%; such as *Web 2.0*), soft skills (26%; *like Effective Managing by Goals*), and others (3%; such as *Online Feedback*). There was an average of 10 trainees per programme (SD = 9.88).

We reached out to 945 employees; 633 responded to the T1 questionnaire, and 274 responded to the T2 questionnaire too. Of these 274 responses, six were invalid with missing data in more than one factor. The final sample included 268 employees (28% response rate, which is adequate in social sciences, especially considering that we sent two questionnaires more than 3 months apart). The mean age was 45.97 years old (SD = 7.10), 53% were female, and 73% ($n = 150$) reported a level of education of at least an undergraduate degree. Regarding the work characteristics, 95% worked in the public sector, being 33% technicians and 33% qualified workers (Appendix A shows a description of the participants).

3.3 | Instruments

To our knowledge, there were no validated instruments that measured the three key variables we wanted to explore in our study. Therefore, instruments were created ad-hoc (Appendix B shows the instruments implemented). The first questionnaire (T1) aimed at collecting data on trainees' beliefs about transfer (17 items), commitment to transfer (four items), and intention to transfer (12 items) before the training. These three factors, based on the studies of Ajzen (1985), Bandura (1986), Gollwitzer (1993), and Latham and Locke (1991), were measured using a 5-point Likert scale: (1) *totally disagree*, (2) *agree a little bit*, (3) *agree*, (4) *agree a lot*, and (5) *totally agree*. Cronbach's α showed a good internal consistency (0.95, 0.97, and 0.87, respectively).

The second questionnaire (T2) aimed at collecting self-reported data about trainees' transfer (degree to which trainees transferred what they learned in training) and implementation intention actions (Gollwitzer 1993). It was applied 3 months after the training with the idea of exploring what and how trainees transferred. The transfer level-based on Pineda et al. (2011) was measured using six items on a 5-point Likert scale: (1) *totally disagree*, (2) *agree a little bit*, (3) *agree*, (4) *agree a lot*, and (5) *totally agree*. The scale was designed to avoid a neutral midpoint. Cronbach's α informed of a high internal consistency (0.92). The implementation intentions scale was formed by nine items and measured by a 5-point Likert scale (*never, rarely, sometimes, many times, always*). Based on Machin and Fogarty (2003) and Van Hooft et al. (2005), we wanted to know what specific actions trainees developed in their workplace during the 3 months after training (e.g., goal-setting, self-management, supervisors' support, peers' support, practising, and opportunities' seeking to transfer). We used the same 5-point Likert scale labels. Cronbach's α reported high reliability of the scale (0.95).

3.4 | Data Analysis

For this study, we used cluster analysis, EFA, NA and SEM.

3.4.1 | EFA

We randomly selected 100 cases to run the EFA, knowing that it was the minimum sample for validation studies, and it was sufficient if the structure was clear (Kline 2015). We selected maximum likelihood as the extraction method because it is the approach used by Amos (and our analysis included an SEM analysis using Amos) and Promax rotation (oblique), because we anticipated the factors to be related. To examine the appropriateness of factor analysis we used Bartlett's test of sphericity and the Kaiser–Meyer–Olkin's measure (Hair et al. 2010). The factors were extracted based on the following criteria: (1) eigenvalues ≥ 1; (2) percentage of variance explained $\geq 60\%$; (3) factor loadings ≥ 0.50; (4) exclusion of items with problematic cross-loadings (difference ≤ 0.20); and (5) a minimum of three items to retain a factor (Hair et al. 2010; Meyers et al. 2013).

3.4.2 | SEM

To run the SEM (Ullman and Bentler 2003), we selected the module of SPSS Amos 28 and used 168 of the randomly selected cases (Muthén and Muthén 2002).

To specify the measurement model, we included 40 items (observable variables), and six factors (latent variables): Beliefs about transfer impact (BTImpact), beliefs about transfer importance (BTImportance), commitment to transfer (CTR), intention to transfer (ITR), implementation intentions (IMI), and transfer (TR). Due to items' syntax, we anticipated that they could have a method effect, therefore, we specified intra-factor error covariances between the items affected based on the modification indices (Brown 2014). We expected the χ^2 to be significant and examined, as recommended, relative fit indexes (tucker-lewis index [TLI] and comparative fit index [CFI] > 0.90, and the root mean squar error of approximation [RMSEA] < 0.06) (Hair et al. 2010; Meyers et al. 2013). Convergent validity (≥ 0.50 for the standardized regression coefficients; Hair et al. 2010) and discriminant validity (inter-factor standardized correlations ≤ 0.90; Kline 2015) were analysed. Consistency of the items was analysed through composite reliability (CR) estimates (≤ 0.70; Nunnally 1994); convergent validity was assessed through the average variance extracted values (AVE > 0.50). The maximum shared variance (MSV < AVE) was considered a good indicator of discriminant validity.

We used the measurement model as a base to specify the structural model (BTImpact, BTImportance, CTR and ITR functioned as exogenous variables, and IMI and TR as dependent or endogenous variables). The covariances amongst the exogenous variables remained because they did not predict each other, however, the covariances amongst the exogenous and endogenous variables were eliminated. An error was added to the endogenous variables and arrows were drawn from each exogenous to each endogenous variable. Model fit was evaluated in the same terms as the measurement model. Figure 2 shows the specified model.

3.4.3 | Cluster Analysis

A two-step cluster analysis was performed, beginning with a hierarchical analysis to identify potential clusters, following the methodology outlined by Milligan (1980) and Yim and Ramdeen (2015). This approach groups participants based on similar scores across variables including BTImpact, BTImportance, CTR, and ITR, encompassing the full sample of 268 participants. The agglomeration schedule, scree plot, and dendrogram confirmed the presence of two distinct clusters. In the second step, K-means clustering was applied to refine the solution, consistent with Milligan's method. Cluster analysis allows for interpretative flexibility (Tondeur et al. 2008; Yim and Ramdeen 2015), facilitating various analytical possibilities regarding the number of clusters. For this study, a two-cluster solution emerged (Cluster 1: low transfer beliefs, intentions and commitment; Cluster 2: high transfer beliefs, intentions and commitment). To further examine group differences, a one-way analysis of variance (ANOVA) and post-hoc tests were conducted, alongside an analysis of correlations between the factors.

In addition to the clustering process, these clusters were used to show distinct transfer readiness groups. A *T*-test of independent samples comparing the two clusters revealed significant differences in IMI scores ($t_{[266]} = -4.81$, $p < 0.001$, Cohen's $d = -0.69$) and transfer scores ($t_{[266]} = -4.92$, $p < 0.001$, Cohen's $d = -0.60$). Specifically, participants in Cluster 1 showed lower IMI ($M = 2.61$, SD = 0.75) and transfer levels ($M = 2.51$; SD = 0.73) compared to those in Cluster 2 ($M_{IMI} = 3.16$, SD = 0.83; $M_{TR} = 2.97$, SD = 0.78). This demonstrated that the clusters not only differentiated between groups but also reflected meaningful differences in the degree of IMI and TR.

3.4.4 | Multigroup SEM by Cluster

The SEM multigroup analysis is a unique type of moderation which involves dividing a data set according to the values of a grouping variable (e.g., transfer readiness) and testing a particular model on each set of data. The model is evaluated individually for the distinct groups and the differences are assessed. Multi-group comparisons are used to test whether associations predicted by a model would vary according to the moderator's value (e.g., transfer cluster; Byrne 2001). We used the prior SEM model and applied the SEM multigroup technique to evaluate the differences that the transfer clusters generated. The sample size of each cluster was equivalent (Cluster 1 = 132; Cluster 2 = 136).

3.4.5 | NA and NA by Cluster

The network approach in psychometrics is crucial for a better understanding of psychological phenomena; it conceptualizes psychological constructs as networks that capture the complexity of human nature more accurately (Borsboom 2022). Network psychometrics, rooted in the tradition of exploratory approaches, not only focuses on traditional statistical inference but also stands out for its ability to visually represent statistical associations (Cramer et al. 2010; Epskamp et al. 2012; Kan et al. 2020).

Borsboom (2022) suggested the application of this innovative technique in the examination of diverse types of

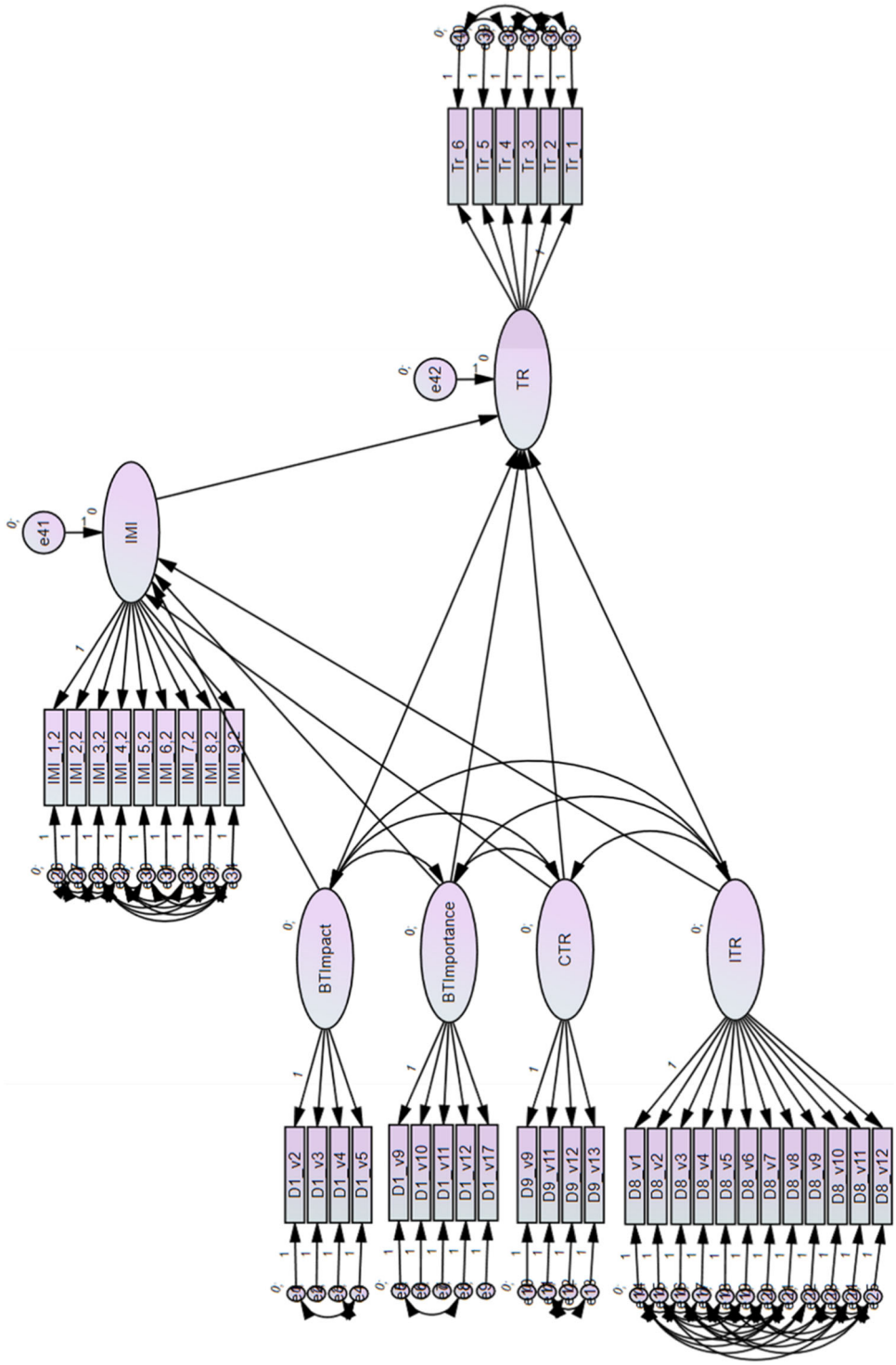

FIGURE 2 | Structural model specified. [Color figure can be viewed at wileyonlinelibrary.com]

conventional data derived from responses to surveys. Thus, network analysis is inherently well-suited for integrating various forms of data and levels of examination (Blanken et al. 2021). In this study, we use NA in two different approaches, one of them to visualize the relations using items representing beliefs in transfer (T1). The second approach is to understand the relations of the factors (variables) involved in the transfer and compare the structure of the network between two clusters.

Epskamp et al. (2012) explained that this methodology employs nodes to represent items on a scale or psychological variables under investigation, with the interconnections between these nodes, referred to as edges, signifying the magnitude of the statistical correlation. The strength of these connections is delineated by weights. For this study, we used four centrality measures to determine the importance of a node to other nodes (Borsboom 2022; Costantini et al. 2015; Epskamp et al. 2018): node strength (direct connections), closeness (indirect connections),

betweenness (importance on average path between two other nodes), and expected influence (anticipated impact, or importance of a node within the network).

In the analysis of the structure of the items, the Huge estimator was applied, based on the High-dimensional Undirected Graph Estimation approach developed by Zhao et al. (2011). This estimator is ideal for analysing relationships in networks with numerous elements, such as the structure of questionnaires in this case. On the other hand, to understand the relationship among the variables involved in the transfer and to make comparisons within each cluster, the EBICglasso estimator (Extended Bayesian Information Criterion; Foygel and Drton 2010) was employed. This criterion provides a balanced measure between model fit and parsimony, meaning that it allows finding an optimal balance between explaining the data and avoiding overfitting the model to noise or idiosyncratic features of the sample.

4 | Results

In this section, we report the results of the EFA and the NA with only beliefs, SEM and NA with all items, and SEM multigroup and NA by the transfer readiness clusters.

4.1 | Analysing the Beliefs Scale

4.1.1 | EFA Approach

The final model showed a nine-item and two-factor solution that explained 66% of the variance. Adequacy was satisfactory (Kaiser–Meyer–Olkin test: 0.85; Bartlett's sphericity test: approx. $\chi^2 = 419.07$, $df = 36$, $p < 0.001$). Four items referred to trainees' beliefs about the potential impact on their personal and professional life if transferring what they learned in training, and loaded onto the latent factor *Beliefs about transfer impact (BTImpact:* D1_v2, D1_v3, D1_v4, and D1_v5*)*, explaining most of the variance (49%). Five items referred to the trainees' beliefs that transferring what they learned in training was useful or relevant to their job and loaded onto the factor named *Beliefs about transfer importance (BTImportance:* D1_v9, D1_v10, D1_v11, D1_v12, and D1_v17*)*, explaining 17% of the variance (Appendix C shows the resulting pattern matrix).

The correlation matrix was inspected to assess the discriminant validity, finding a relation between the factors lower than 0.70 ($r = 0.56$). Hence, discriminant validity was considered satisfactory. Reliability was good (α *BTImpact* = 0.86; α *BTImportance* = 0.83; $\alpha = 0.86$ for the complete scale).

4.1.2 | NA Approach

The resulting network showed a structure where the variables were interconnected, but not fully (sparsity = 0.22), suggesting the presence of clusters or subgroups within the set of variables. Likewise, the centrality measures highlighted item D1_v2 as a central node (betweenness = 1.88, closeness = 1.72, strength = 2.38, expected influence = 1.34), due to its connections with other items and its influence. The values of the clustering measures indicated a tendency to form commonalities, as observed in Figure 3. The variables tend to cluster into two poles. These results support similarity with the findings obtained in the factor analysis.

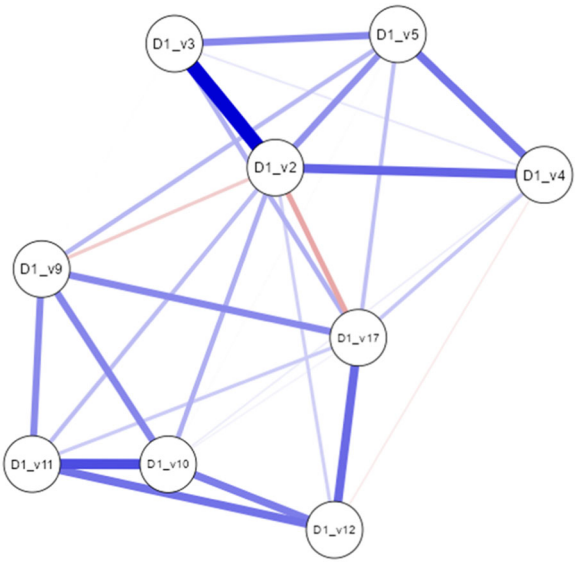

FIGURE 3 | Network analysis. [Color figure can be viewed at wileyonlinelibrary.com]

In addition, the results of the weight matrix showed there was a strong positive relationship between D1_v3 and D1_v2, with a weight of 0.48, and D1_v9 and D1_v10, with a weight of 0.34. On the other hand, there was a weakly negative relationship between D1_v2 with D1_v17 and D1_v09, weights −0.17 and −0.09, respectively.

4.2 | Analysing the Model

4.2.1 | Model's SEM

The measurement model (Figure 4) was specified as described in the data analysis section.

As anticipated, the χ^2 (966.90) was significant ($df = 665$, $p < 0.001$). Relative fit indexes indicated that the model fit the data well (TLI = 0.95; CFI = 0.95; ≥ 0.90; RMSEA = 0.05, 90% CI [0.05–0.06]) (Hair et al. 2010; Meyers et al. 2013). We evaluated convergent validity for the factors through an examination of the standardized regression coefficients for the factor loadings (0.52–0.97, > 0.50; Hair et al. 2010). All standardized regression coefficients were significant ($p < 0.001$, 0.05, 0.01). The standardized inter-factor correlations (0.23–0.74) suggested a good discriminant validity (≤ 0.90; Kline 2015). Composite reliability (CR) values for the factors ranged from 0.88 to 0.97, higher than the minimum required level (0.70; Nunnally 1994), suggesting the consistency of the measures.

Then we specified the structural model. As we had predicted, the chi-square was significant ($\chi^2 = 985.92$, $df = 672$, $p < 0.001$).

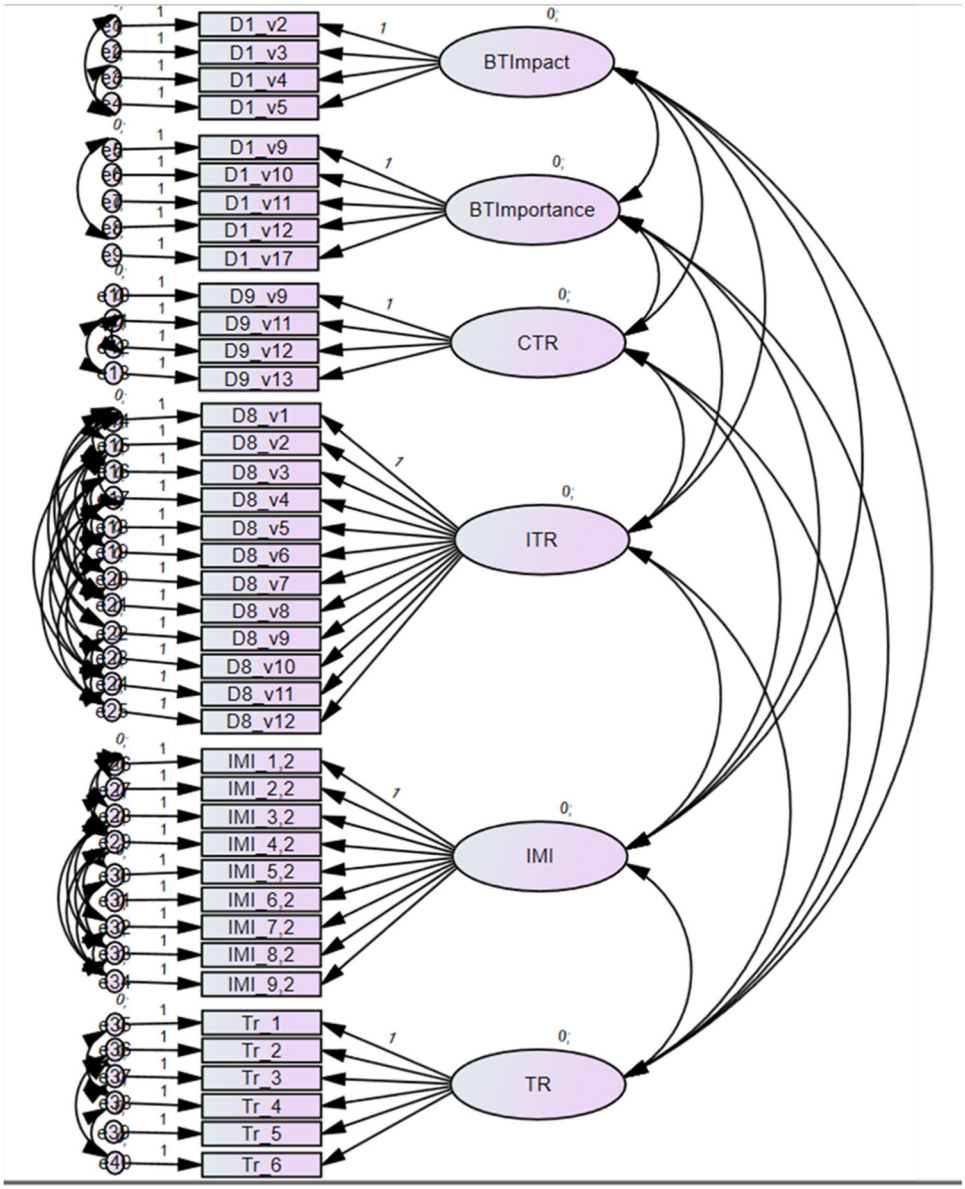

FIGURE 4 | Specified measurement model. [Color figure can be viewed at wileyonlinelibrary.com]

Relative fit indices indicated that the model fit the data well (TLI = 0.95; CFI = 0.95; ≥ 0.90; RMSEA = 0.05, 90% confidence interval [CI] [0.05–0.06]).

Table 1 shows the paths representing each significant relationship between the exogenous and endogenous variables, the regression coefficients (nonstandardized, *B*), the standard error for the beta coefficient (nonstandardized, *SE B*), the beta coefficient (standardized, β), and the probability level (p).

Figure 5 illustrates the regression coefficients (standardized) for the structural specified model.

4.2.2 | Model's NA

The network analysis showed a structure with six nodes and nine nonzero connections, resulting in a sparsity of 40%. The variable CTR stood out with high betweenness and closeness, suggesting a crucial role as a bridge between nodes and a close connection with other variables. On the other hand, IMI showed significant strength and expected influence. Furthermore, the examination of clustering measures—specifically Barrat (1.42), Onnela (1.61), and WS (1.55)—shows that BTImpact is robustly connected with adjacent nodes within the network. However, the lower Zhang measure (0.78) implies that BTImpact may not primarily dictate the directionality of relationships amongst other variables, suggesting a more generalized influence rather than a prescriptive one.

In contrast, the TR variable shows negative values across all clustering measures—Barrat (−1.23), Onnela (−1.30), WS (−1.39) and Zhang (−1.21)—indicating its role as a peripheral node with weak direct connections to other variables. Thus, while TR is included within the network, its realization and impact are heavily reliant on the dynamics and influences exerted by more central variables.

TABLE 1 | Relation between exogenous and endogenous variables.

Path	*B*	*SE B*	*β*	*p*
Commitment to transfer (CTR)—implementation intentions (IMI)	0.23	0.06	0.34	***
Implementation intentions (IMI)—Transfer (TR)	0.93	0.16	0.64	***

Note: $N = 168$.
***$p \leq 0.001$.

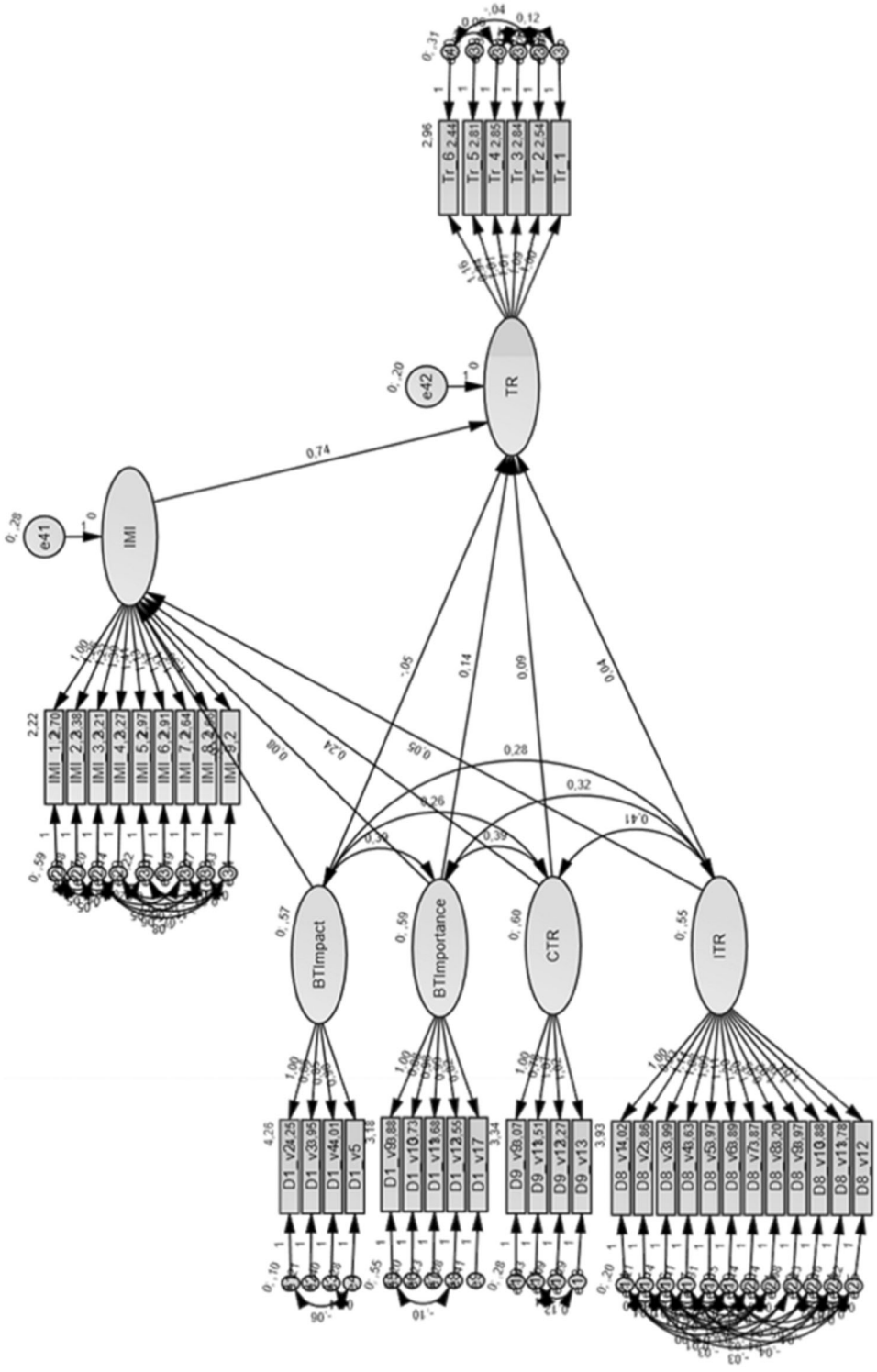

FIGURE 5 | Structural model: Standardized regression coefficients.

The weight matrix highlighted notable connections, such as the strong relationship between IMI and TR, BTImpact and BTI Believes, and ITR and CTR. Figure 6 shows the NA architecture.

4.3 | Analysing the Model by Clusters

4.3.1 | SEM Multigroup by Cluster

The analysis was performed in two steps: the complete model comparison by the two clusters and the analysis of the individual paths.

First, the paths of the models were constrained to be equal, and the chi-square difference (χ^2) and the degrees of freedom of the constrained models and the unconstrained models were analysed. The difference of the chi-square and the degrees of freedom (df) of the unconstrained models and the fully restricted model was analysed ($\Delta\chi^2 = 415{,}938$, $\Delta df = 82$, $p < 0.001$), showing the models were significantly different based on the transfer cluster.

Second, to evaluate whether the transfer cluster generated differences at the level of the individual paths, the two models were estimated without restrictions for all paths except one, restricting one path at a time to be equal between groups and performing a chi-square difference test, as shown in Table 2.

Figure 7 shows the resulting models based on the clusters.

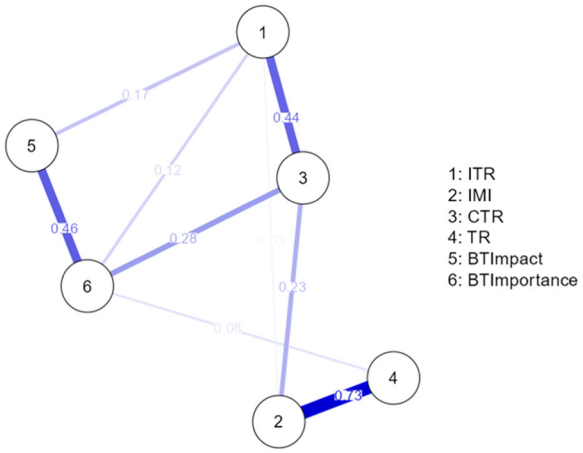

FIGURE 6 | Network analysis of the model. [Color figure can be viewed at wileyonlinelibrary.com]

4.3.2 | NA by Cluster

In the NA with two clusters, significant differences in structure and connectivity were observed. For Cluster 1, a moderately interconnected network, sparsity = 33% (nonzero edges = 10/15). In contrast, Cluster 2 displayed a denser network, with around 20% (nonzero edges = 12/15) of connections active amongst its nodes. These variations revealed diversity in the organization and interconnection patterns across the different clusters (see Figure 8).

In Cluster 1, IMI showed the highest strength and expected influence (1.46) as well as closeness (0.43), indicating its central role within the network. However, betweenness had the same value for IMI and CTR (0.91). Conversely, in Cluster 2, CTR showed a more prominent role with the highest betweenness (1.58), closeness (1.45), and expected influence (0.90), suggesting that commitment was key to the functioning of the network. Indeed, in Cluster 2, IMI had the highest strength (0.98). The weight matrix supports these findings, revealing stronger connections between CTR and other variables in Cluster 2 (e.g., CTR-IMI = 0.29, CTR-BTImportance = 0.31, and CTR-ITR = 0.39), as well as a strong relationship between IMI and TR (0.64). Additionally, weak relationships were found in Cluster 2 between BTImpact and ITR (−0.06), CTR (−0.07), and TR (−0.07), as well as between BTImportance and IMI (−0.08) and TR (0.19). In contrast, Cluster 1 showed fewer relationships amongst the variables, with only the connections between IMI-TR (0.71) and CTR-ITR (0.31) being significant.

5 | Discussion

We explored in-depth the relation of transfer beliefs with transfer using both variable and person-oriented approaches according to trainees' transfer readiness. Being transfer beliefs an understudied topic, this study adds value to the transfer field

TABLE 2 | Multigroup analysis at the path level.

Path	B Cluster 1	B Cluster 2	$\Delta\chi^2$	df	p
BTImpact—IMI	0.07	−0.13	0.56	1	0.45
BTImportance—IMI	0.21	−0.06	2.56	1	0.11
CTR—IMI	0.19	0.53***	1.75	1	0.19
ITR—IMI	0.08	0.20	0.38	1	0.54
IMI—TR	1.03***	0.79***	0.88	1	0.35
BTImpact—TR	0.008	−0.30	1.38	1	0.24
BTImportance—TR	−0.32	0.28	3.94	1	0.05
CTR—TR	0.54	−0.14	1.25	1	0.26
ITR—TR	−0.02	0.13	0.81	1	0.37

Note: $N = 268$ (Cluster 1 = 132; Cluster 2 = 136).
***$p \leq 0.001$.

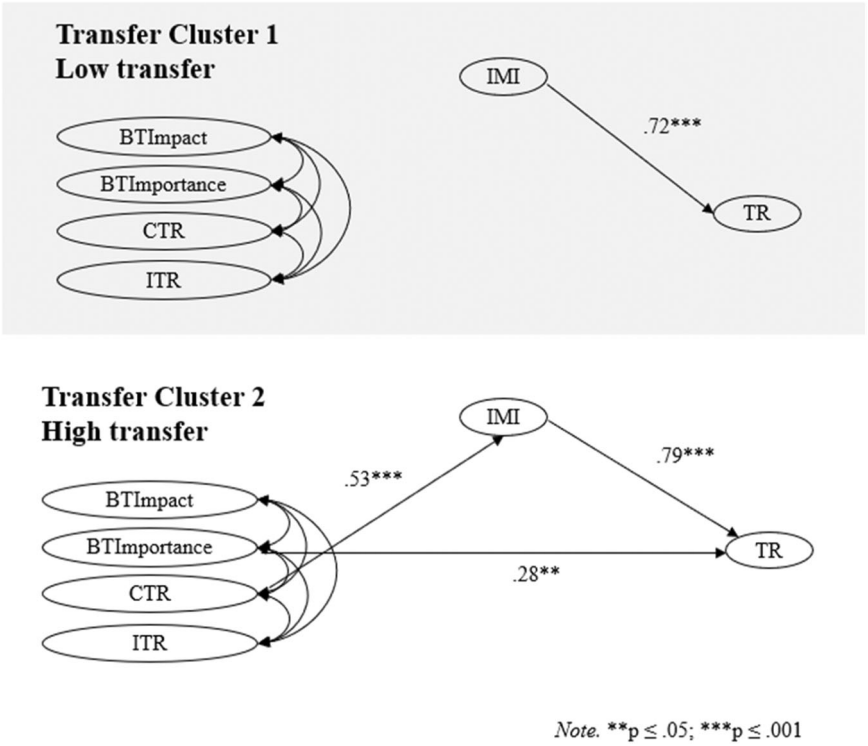

FIGURE 7 | SEM multigroup by cluster.

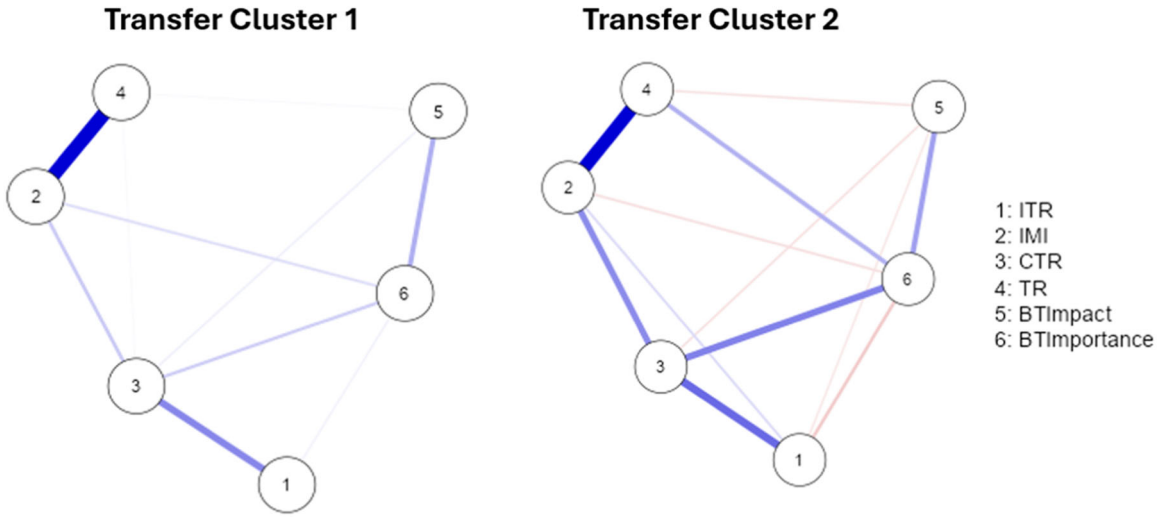

FIGURE 8 | Clusters network structure. [Color figure can be viewed at wileyonlinelibrary.com]

by exploring transfer beliefs and their relation to transfer, other factors related to transfer, and different transfer readiness profiles (high and low).

Moreover, we used a combination of SEM, NA, and cluster analysis. Through SEM, we explored the direct and indirect relationships between variables (variable-oriented approach) that influenced training transfer and examined complex interactions that may not be readily apparent in a simple view. Through NA, we aimed to gain a comprehensive understanding of human behaviour (person-oriented approach) and conceptualized transfer beliefs as interconnected factors that we studied as networks of complex and causally related systems (Borsboom 2022; Hevey 2018).

In the following lines, we compare the results obtained through each analysis: EFA and NA of the beliefs scale, SEM and NA of the model, and SEM multigroup and NA by cluster.

The EFA of the beliefs scale yielded a satisfactory two-factor, nine-item structure, accounting for 66% of the variance. The factors, beliefs about transfer impact (four items) and beliefs about transfer importance (five items), demonstrated discriminant validity and reliability. NA results affirmed this two-factor model. Future studies should assess these constructs in varied transfer contexts to extend previous research in beliefs and transfer (e.g., Quesada-Pallarès et al. 2022; Quratulain et al. 2021; Choi and Roulston 2015; Subedi. 2006). Additionally,

NA revealed negative item correlations, highlighting the complex nature of beliefs about applying training knowledge and the value of additional analyses for a nuanced understanding of transfer and beliefs measurement tools (Borsboom 2022).

The model revealed that CTR influenced IMI and IMI significantly influenced TR. This means an indirect relationship between CTR and TR existed via IMI, which is consistent with the findings of Villaseñor et al. (2024). In the same way, the NA results supported the crucial role of CTR and IMI in their relations with TR. Our research contributes to the insights by Malaguti et al. (2020) in the health and transfer sector, emphasising the significance of IMI in effecting behavioural change. It further supports the notion that formulating implementation intentions boosts the likelihood of effective behaviour execution. We demonstrate, in line with Smith et al. (2008) and Weisweiler et al. (2013), how integrating motivational theories (Ajzen 1985) with the concept of implementation intention (Gollwitzer 1993) might narrow the intention–behaviour gap. Similarly, CTR played a pivotal role, serving as a bridge among variables and maintaining a tight connection with other factors.

On the other hand, the clustering measures from the NA indicated that BTImpact was strongly linked with other adjacent nodes within the network. This finding suggests that participants with robust beliefs regarding the impact of transfer tend to have stronger connections with other elements of the transfer process, thereby facilitating the manifestation of related intentions or behaviours associated with transfer. However, it is important to note that a strong belief in the impact of transfer does not necessarily translate into the intention to transfer or the actual ability to do so. Notably, our results from the SEM did not yield a similar outcome, as BTImpacts were not significantly related to other variables in the model. This discrepancy underscores the importance of utilizing complementary analyses to gain a more comprehensive understanding of the data (Borsboom 2022).

When analysing the model across clusters, the transfer readiness appeared to moderate the relationships between the variables. IMI correlated with transfer in both clusters, underscoring its significance across varying groups of transfer readiness and emphasizing the critical volitional phase in behaviour change models (Gollwitzer 1993). In the high transfer readiness group (Cluster 2), both the SEM and NA revealed denser connections, particularly showing that CTR indirectly influenced TR via IMI. Notably, TR was positively associated with both IMI and BTImportance.

However, an intriguing finding, though not statistically significant, was the negative relationship between IMI, TR, and BTImpact. This suggests that while individuals may believe that transfer has a positive impact, they do not necessarily commit or intend to engage in the transfer process, indicating the presence of other influencing factors. In contrast, BTImportance showed a positive relationship with TR, further emphasizing the distinction between believing in the importance of transfer and believing in its impact.

In Cluster 1 (low transfer readiness), the SEM results revealed only a connection between TR and IMI, whereas the NA identified both the IMI–TR relationship and an additional link between CTR and ITR (intention to transfer). This discrepancy may stem from the differing focus of the two methods: NA prioritizes the strength of connections between all variables, while SEM explores directionality and causality. These results indicate that having mere transfer intentions is insufficient; transfer commitment is essential. As suggested by Nenkov and Gollwitzer (2012), one may have low intentions to transfer but still succeed if genuinely committed. Without the conscious decision and commitment to transfer, the intention may falter when faced with challenges.

This overall pattern underscores the critical role of transfer commitment in achieving successful transfer outcomes, suggesting that as individuals progress in their readiness to transfer, their focus shifts from merely intending to implement transfer strategies to actively committing to and engaging in the transfer process.

6 | Conclusions

Through these analyses, we answered research question 1 (RQ1) *What kind of trainees' beliefs will ensure higher transfer readiness?* Considering all the results, even though transfer beliefs emerged in two factors, BTImpact was not related to transfer, and BTImportance was related to transfer only when transfer readiness was high. The fact that BTImpact is understood as the long-term consequences of transferring might explain this situation (Barnett and Ceci 2002).

Regarding research question 2 (RQ2) W*hat is the influence of beliefs on transfer and related factors?* The analyses showed that IMI was a key factor in the two clusters, CTR and BTImportance were relevant only when the transfer readiness was high, and BTImpact and ITR were not relevant at all.

Our study has identified that beliefs about the importance of transfer play a significant role in determining transfer readiness, particularly in organizations in which employees show a tendency of having high transfer readiness (Quesada-Pallarès et al. 2022). Additionally, we have demonstrated that implementation intentions have a substantial impact on transfer, acting as mediators between commitment to transfer and transfer itself (Valshtein et al. 2020).

The implications of our study emphasize that using various approaches enhances our understanding of complex phenomena. Regarding research implications, employing a diverse range of methods deepens our comprehension of intricate issues, uncovers hidden patterns, supports cross-validation, and stimulates the generation of new hypotheses. From a practical standpoint, these findings can inform the design of training and development programmes aimed at fostering positive beliefs about the importance of knowledge transfer. Encouraging the creation of implementation intentions can significantly improve the effectiveness of learning transfer across various organizational contexts (Wang et al. 2022). These insights also highlight the role of Human Resource departments in cultivating a culture where knowledge transfer is not only beneficial for the organization but also meaningful and valuable for employees.

Additionally, including the formulation of specific action plans during training can enhance transfer readiness.

A limitation of our study is that it is crucial to consider that beliefs can be influenced by culture, so data from different contexts should be gathered and interpreted with caution (Bhawani 2006). We also recommend performing mixed-methods studies in which qualitative data could be gathered to better understand some of the results.

Ultimately, our study provides a solid foundation for future research to further explore the interrelationships between beliefs about transfer, other transfer-related factors, and transfer outcomes in different contexts and populations, aiming to optimize learning and development processes in workplace settings. Our study also uncovers the need of different and innovative data analysis techniques, which will provide us with more understanding of an unsolved complex phenomenon.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data supporting this study's findings are available on request from the corresponding author. The data set is not publicly available since it contains information that could compromise the privacy of the research participants.

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Appendix

Table A1

TABLE A1 | Sample characteristics.

Gender	Male: 64 (24%)
	Female: 142 (53%)
	Not answering: 62 (23%)
Age	Mean: 45.97 years
	Standard deviation: 7.1 years
Job role	Manager: 13 (6%)
	Middle manager: 37 (18%)
	Technician: 68 (33%)
	Qualified worker: 68 (33%)
	Nonqualified worker: 17 (8%)
	Intern: 3 (2%)
Level of education	Primary education: 2 (1%)
	Secondary education: 2 (1%)
	Middle level of Vocational Education and Training: 5 (2%)
	Baccalaureate: 25 (12%)
	High level of vocational education and training: 6 (3%)
	Undergraduate degree: 150 (73%)
	Graduate degree: 10 (5%)
	PhD: 6 (3%)
Training modality	In-person: 9 (4%)
	Online: 257 (96%)
Organization	South Spain Public Administration: 96 (36%)
	Northwest Spain Public Administration: 157 (59%)
	Private Organization: 13 (5%)

Appendix 2. Instruments implemented*

*Items have been translated into English for publishing purposes only.

First Questionnaire (T1)

What do you think about how you apply the learnings from training to your workplace?

Please rate the extent to which the following statements express your beliefs about how you apply the learnings in your workplace. Scale: (1)

do not agree at all—(2) agree a little—(3) agree—(4) much agree—(5) totally agree.

1. I believe that the purpose of the training is to apply to my job, the learning that I have acquired in it *(BTImpact)*.

2. I believe that applying what I have learned from the training to my job position enriches me professionally *(BTImpact)*.

3. I think that applying the learning from the training to my job helps me to update myself professionally *(BTImpact)*.

4. I believe that applying the learning from the training to my job position enriches me personally *(BTImpact)*.

5. I believe that applying what I have learned from the training to my job position helps me become more professional *(BTImpact)*.

6. I believe that if I apply what I have learned in training to my job, my way of working is effective *(BTImpact)*.

7. I think that if I apply what I have learned in training to my job, I work quickly *(BTImpact)*.

8. I think that applying the learning from the training to my job helps me to work more concretely *(BTImpact)*.

9. I believe that it is essential for my work that I apply what I have learned in training *(BTImportance)*.

10. I think it is useful for my work that I apply what I have learned in the training *(BTImportance)*.

11. I think it is important for my job that I apply what I have learned in training to my job *(BTImportance)*.

12. I think that if I apply what I have learned from the training, I do my job better *(BTImportance)*.

13. I think that with the application that I do of the learning from the training to my job, I continue learning *(BTImportance)*.

14. I believe that when the training is useful, I must apply the learning from the training to my job *(BTImportance)*.

15. I believe that when the training meets my professional needs, I should apply the learning from the training to my job *(BTImportance)*.

16. I believe that by applying the learning from the training to my job, I improve my professional practice *(BTImportance)*.

17. I believe that by applying what I have learned from the training to my workplace, I can adapt to the demands that work has on me on a daily basis *(BTImportance)*.

To what extent is it a priority for you to apply the learnings from the training to your job?

Please rate the degree to which the following statements express your level of commitment to applying the learnings from the training to your job. Scale: (1) do not agree at all—(2) agree a little—(3) agree—(4) much agree—(5) totally agree.

1. I am willing to push myself beyond what I would normally do to apply what I have learned in the training to my job *(CTR)*.

2. When I apply the learning from the training to my job, I will not give it up*(CTR)*.

3. I will do my best to apply what I have learned in the training to my job *(CTR)*.

4. I will not give up in my efforts to apply the learning from the training to my job *(CTR)*.

To what extent is it your goal to apply the learnings from the training to your job?

Please rate the extent to which the following statements express your intention to apply the learnings from the training to your job. Scale: (1) do not agree at all—(2) agree a little—(3) agree—(4) much agree—(5) totally agree.

1. I want to apply the learnings from the training to my workplace over the next few months *(ITR)*.

2. I would like to apply the learnings from the training to my workplace over the next few months *(ITR)*.

3. Over the next few months, I intend to apply the learnings from the training to my workplace *(ITR)*.

4. I want to apply what I have learned in the training to my job in the coming months.

5. During the next few months, I will apply what I have learned in the training to my job *(ITR)*.

6. I am determined to apply the learning from the training to my job in the coming months *(ITR)*.

7. I intend to apply what I have learned in the training to my job in the coming months *(ITR)*.

8. Over the next few months, I aim to apply what I have learned in the training to my job *(ITR)*.

9. I look forward to applying what I learned in the training to my job in the coming months *(ITR)*.

10. Over the next few months, I will try to apply what I have learned in the training to my job *(ITR)*.

11. Over the next few months, I will make an effort to apply what I have learned in the training to my job *(ITR)*.

12. I plan to apply what I learned in the training to my job in the coming months. *(ITR)*

Thank you for your answers

Second Questionnaire (T2)

To what extent have you applied what you learned in the training you attended 3 months ago to your job? Please rate the extent to which the following statements express the degree to which you have applied what you learned in the training you attended 3 months ago to your job. Read each of the statements carefully. And remember, there are no wrong or incorrect answers. Scale: (1) do not agree at all—(2) agree a little—(3) agree—(4) much agree—(5) totally agree.

1. Due to training, I have changed my professional performance *(TR)*.

2. The training has allowed me to improve my professional performance *(TR)*.

3. Training helps me achieve the objectives of my job *(TR)*.

4. Due to the training, I have introduced changes in the way I work *(TR)*.

5. The people I work with believe that my professional performance has improved due to the learning acquired during the training *(TR)*.

6. I have applied what I have learned during the training to my job *(TR)*.

Below we present a series of actions that you may have taken to apply what you learned in training to your job in recent months. Please rate to what extent you have carried out these actions. Read each of the statements carefully. And remember, there are no wrong or incorrect answers. Scale: (1) never—(2) rarely—(3) sometimes—(4) often—(5) always.

1. I have discussed with my boss how to apply what I have learned in the training to my job *(IMI)*.
2. I have discussed with my co-workers how to apply what I have learned in the training to my job *(IMI)*.
3. I have reflected on how to apply what I have learned in training to my job *(IMI)*.
4. I have analysed how I can successfully apply what I have learned in training to my job *(IMI)*.
5. I have looked for opportunities to apply what I have learned in training to my job *(IMI)*.
6. I have reviewed the training materials to apply what I have learned to my job *(IMI)*.
7. I have practiced how to apply, in my job, what I have learned in training *(IMI)*.
8. I have set specific goals to maintain what I have applied to my job *(IMI)*.
9. I have analysed the success I have had in applying what I have learned in training to my job *(IMI)*.

Thank you for your answers.

Appendix 3.

Table A3.

TABLE A3 | EFA pattern matrix.

Pattern matrix		
	Factor	
Items	**1**	**2**
D1_v2. I believe that applying what I have learned from the training to my job position enriches me professionally		0.92
D1_v3. I think that applying the learning from the training to my job helps me to update myself professionally		0.78
D1_v4. I believe that applying the learning from the training to my job position enriches me personally		0.76
D1_v5. I believe that applying what I have learned from the training to my job position helps me become more professional		0.65
D1_v9. I believe that it is essential for my work that I apply what I have learned in training	0.59	
D1_v10. I think it is useful for my work that I apply what I have learned in the training	0.71	
D1_v11. I think it is important for my job that I apply what I have learned in training to my job	0.80	
D1_v12. I think that if I apply what I have learned from the training, I do my job better	0.85	
D1_v17. I believe that by applying what I have learned from the training to my workplace, I can adapt to the demands that workplaces on me on a daily basis	0.56	

Note. Extraction method: maximum likelihood (ML). Rotation method: Promax with Kaiser normalization. Rotation converged on three iterations. $n = 100$.