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RESEARCH ARTICLE

Developing and validating the diversity, equity, inclusion, and antiracism staff perceptions of college climate (DEIA SPCC) scale in pharmacy staff

Rania El-Desoky[1], Alaa K. Abdelhakiem[2], Andrea Stroud[3], Joshua Wollen[4]

[1] School of Allied Health, University of Western Australia, Crawley, Western Australia
[2] Department of Pharmacy Practice and Clinical Sciences, University of Texas at El Paso School of Pharmacy, El-Paso, United States
[3] Consultant Statistician, Houston, United States
[4] Department of Pharmacy Practice and Translational Research, University of Houston College of Pharmacy, Houston, United States

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Correspondence
Rania El-Desoky
School of Allied Health
University of Western Australia
Australia
reldesok@gmail.com

Abstract

Background: This study focuses on the development and validation of the Diversity, Equity, Inclusion, and Antiracism Staff Perceptions of College Climate (DEIA SPCC) Scale. The goal of this study was to create and validate a standardised tool to assess pharmacy staff perceptions of DEIA within their institutions, thereby aiding in the evaluation and advancement of DEIA initiatives in colleges of pharmacy. **Methods:** A 20-item survey covering four domains - diversity, equity, inclusion, and antiracism - was distributed to pharmacy staff through the American Association of Colleges of Pharmacy (AACP) directory. The survey's validity was assessed using factor analysis and reliability analysis. **Results:** There was a total of 135 staff member responses. Results demonstrated high reliability and consistency across all four domains, with the Cronbach's alpha ranging between 0.764 to 0.951. **Conclusion:** The study concluded that the DEIA SPCC survey is a practical, validated tool for pharmacy institutions to assess and enhance their DEIA climate from the perspective of their staff, potentially extendable to other healthcare academic disciplines. Further research is suggested to validate the survey in broader contexts and explore the predictors of survey scores.

Introduction

As evidenced by the past few years, Diversity, Equity, Inclusion, and Anti-Racism (DEIA) has become a growing force within society, with healthcare being no exception. The term DEIA speaks to ensure that individuals feel respected and valued and that there is representation and fairness amongst all. These initiatives are essential for building a fair, inclusive, and equitable society where there is a promotion of social justice and contribution to the well-being and success of individuals and communities (Hussain *et al.*, 2022; Maroof *et al.*, 2023). The American Association for Colleges of Pharmacy (AACP) has made a commitment to its DEIA efforts within the pharmacy profession (American Association of Colleges of Pharmacy, n.d.). In 2020, AACP established a DEIA committee with the goal of providing guidance, strategic recommendations, and action steps to achieve the diversity, equity, and inclusion goals and needs of the organisation, members, leadership, and staff. Additionally, the Center for Advancement in Pharmacy Education (CAPE) has incorporated DEIA into the CAPE 2022 Educational Outcomes and the Accreditation Council for Pharmacy Education (ACPE) Standards 2025 (Accreditation Council for Pharmacy Education, 2015; American Association of Colleges of Pharmacy, 2021).

Several pharmacy institutions have demonstrated integrating cultural competency at a curricular and institutional level, while other schools are still in the process of integrating DEIA efforts at their institution (Doroudgar *et al.*, 2021; Haas-Gehres *et al.*, 2021; Henson & Drame, 2022; Arif et al., 2023). The relationship between cultural competence and DEIA lies in the shared goal of fostering an inclusive

environment that respects and values diverse backgrounds, ultimately enhancing the educational experience and ensuring equitable treatment for all individuals. Institutional DEIA efforts should encompass all stakeholders of an academic pharmacy institution, including students, staff, faculty, and administrators. It is pivotal that each member's voice is heard to promote a culture of inclusivity, where there is a climate that supports their well-being and professional development while also fostering a positive and productive work environment (Arif *et al.*, 2023). This is vital not only for their individual success but also for the success of the institution. Although there are several initiatives to advance DEIA efforts within the pharmacy profession, the literature is lacking regarding how these initiatives are being perceived by key stakeholders within the institution (Swidrovich, 2021; White et al., 2022; Arif *et al.*, 2023).

In the landscape of academic pharmacy institutions, pharmacy staff play a crucial and multifaceted role. Their contributions are integral to the overall functioning and success of pharmacy colleges. Some pharmacy staff roles include administrative support, student services, laboratory support, library services, technology and IT support, financial management, professional development, and community engagement. Although the roles and responsibilities of staff may vary from one institution to another, they are all instrumental in supporting the institution's goals and objectives and providing the infrastructure necessary for effective functioning. Despite their integral role, there is limited data available on how pharmacy staff perceive DEIA efforts at academic pharmacy institutions. To measure these efforts, institutions need a validated and practical tool to assess pharmacy staff perceptions of the DEIA climate. This tool will identify successes and gaps and provide recommendations for advancing DEIA at pharmacy colleges of pharmacy.

There are various DEIA survey instruments utilised to assess the climate of DEIA at higher institutions for faculty, staff, and students (Hanover Research, n.d.; Stanford University, n.d.; University of Michigan, n.d.). Despite the availability of these survey tools, they are lengthy, unvalidated, and fail to provide sufficient information for actionable change. Moreover, they lack content tailored to the pharmacy staff's unique roles and responsibilities in an academic health profession setting. In addition, contextual factors that influence pharmacy staff's experiences are not captured in survey tools currently in the literature. Due to these significant limitations, a validated assessment tool, the DEIA staff perceptions of college climate (SPCC) survey, was developed specifically for pharmacy staff members. The DEIA SPCC survey can also be extended for utilisation to assess staff perceptions at other related academic healthcare disciplines, provided it undergoes validation in that population.

The objective of this study was to create and validate a standardised tool that higher education pharmacy institutions across the United States can utilise to assess staff perceptions of DEIA within their institution. With the implementation of this survey tool, institutions will be able to analyse their college climate as it pertains to pharmacy staff and critically review current institutional DEIA practices and incorporate measurable and actionable goals.

Methods

A survey of 20 questions focused on DEIA perceptions of respondents' current institution was distributed to faculty and staff in the AACP directory. Staff respondents who completed all items of the survey tool were used in the content validity analysis of the survey tool.

The survey was divided into four domains: diversity, equity, inclusion, and antiracism. Each domain was designed to ascertain the respondent's perception of their institution's performance in each domain. The questions were also designed to function on an overall scale using all four domains together. Some survey questions were adapted from the Stanford IDEAL survey and were reviewed by a DEIA expert in pharmacy education (Stanford University, n.d.). The Stanford IDEAL survey was created to comprehensively address various aspects of DEIA in all aspects of academia, focusing on the experiences of individuals within the Stanford community. The survey covers several domains, including demographics and identity, sense of belonging and inclusion, microaggressions, discriminatory and harassing behaviours, and reporting mechanisms to the university. Given the survey's academic orientation, specific elements related to demographics, inclusion, and belonging were adapted to suit the context of pharmacy staff.

The survey was distributed using Qualtrics (version 12.23) via an anonymous email link. Responses were collected from December 2, 2022, to March 1, 2023. Respondents were to answer each question using a 5-point Likert scale ranging from "*strongly disagree*" to "*strongly agree*" with a "*neither disagree nor agree*" option. Each DEIA perception question was programmed into Qualtrics as required. Some items were created as reverse-scored items assigned opposite numbers on an interval scale from the forward-scored items. The reverse-scored questions are indicated in Table I with a (*) superscript. One item was inadvertently duplicated,

and the team used the data from the first item's appearance in the analysis. The questions removed from the DEIA-FPCC survey during its validation study were also removed from the staff survey prior to analysis (Wollen *et al.*, 2023).

The survey results were analysed using a factor analysis for reliability within each domain and overall. All data analysis was performed using IBM SPSS (version 28.0.1.0). A Bartlett test of sphericity was used to determine if the variables were correlated strongly enough and were suitable for factor analysis. A Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was used to determine suitability for factor analysis by predicting the proportion of common variance (Kaiser, 1970). The target for Bartlett's test of sphericity was a significant value < 0.05, and the target for the KMO was Kaiser and Rice's "*meritorious*" threshold of 0.80 or greater (Kaiser & Rice, 1974; Field, 2018). The results were acceptable, and the data was analysed using a factor analysis.

A factor analysis produced a communalities table, a correlation matrix, and a component matrix. The factor analysis used the varimax rotation method with Kaiser normalisation for the DEIA dimensions, which is common for this validation procedure (Kaiser, 1958; Echeverri *et al*., 2010; Field, 2018). The factor analysis was completed by extracting four fixed factors since the domains were predetermined. A principal component analysis was used to determine items to include and suppressed coefficients < 0.4 from the analysis and considered only loading 0.5 or greater to each factor. Items that were removed were those that loaded < 0.5 to the intended factor (dimension) or the coefficient's cross-loading magnitude was greater than the load to the intended factor (Park, 2021). The analysis was repeated once qualifying items were removed to generate finalised coefficients.

The finalised set of items underwent a reliability analysis using descriptive statistics, item-total statistics for item discrimination, and Cronbach's Alpha for internal consistency. This analysis was completed for each dimension and the model overall. Items were examined for a Cronbach's alpha of > 0.7 and a corrected item-total correlation (point biserial) of > 0.30 (Henrysson, 1963; Krumrei-Mancuso & Rouse, 2016; Tsang *et al.*, 2017; Field, 2018; Taber, 2018). The acceptable threshold of > 0.3 for the corrected item-total correlation is per Field's recommendation (Field, 2018). The threshold for a small sample (less than 300) has a standard acceptable range of > 0.7 for Cronbach's alpha per Kline and is also supported in this circumstance by Field (Kline, 1999; Field, 2018).

This study was exempted from review by the University of Texas El-Paso institutional review board under the following federal guidelines: 45 CFR 46.104(b)(2).

Results

A total of 176 interactions with the survey occurred. Of those, 135 staff respondents completed 100% of the items and were used in the content validation analysis for the survey (n=135). A total of six questions were removed, including two from the diversity domain, one from the equity domain, two from the inclusion domain, and one from the antiracism domain. The rationale for removing these six items is detailed in the section below. Bartlett's test of sphericity was significant (< 0.001), and the test statistic was 1075.118, which indicates that the factor analysis is appropriate. The KMO measure of sampling adequacy met the target of > 0.80 (0.815), indicating that the factor analysis is appropriate.

Factor analysis

The finalised factor analysis produced four components that explained 70.3% of the total variance. The percentage of variance explained by each component is available in Table I as r2. All but one of the finalised items loaded to their intended components > 0.5, and all but two finalised items had a communality extraction > 0.5. The item "*I feel uncomfortable voicing my opinion among faculty and administrators at my college/school of pharmacy*" loaded slightly under the 0.5 threshold but was retained since F2 was its strongest load. The two items "*I feel that I am treated fairly compared to other staff at my college/school of pharmacy*" and "*I feel uncomfortable voicing my opinion among faculty and administrators at my college/school of pharmacy*" had communality extractions of 0.480 and 0.408, respectively. They were kept in the analysis since reliability with the rest of the items in their domains was acceptable. The item "*I feel that I have experienced overt macroaggressions on the basis of race or ethnicity at my college/school of pharmacy*" cross-loaded to component F1 (0.502) but to a lesser degree than its intended component F4 (0.679). A decision was made to keep this question as it had a stronger load to its intended component and had a communality extraction coefficient of 0.803. The four components the items were loaded to are numbered F1-F4 in order of the percentage of variance explained (r2). For readability, the components are ordered in the order "*DEIA*" rather than the component number in Table I. The communalities extraction coefficient is available in Table I in the h2 column.

Reliability analysis

The Cronbach's alpha for each section is available in Table I and ranges from 0.764 to 0.951. The corrected item-total correlation is also reported in Table I. Of note, the corrected item-total correlation between the two diversity questions is the same value for each because there were two questions in that domain; therefore, they have the same correlation to each other. The reliability analysis of all 14 finalised items together yielded a Cronbach's alpha of 0.884 and corrected item-total coefficients ranging from 0.517 to 0.751. The lowest Cronbach's alpha of any one item deleted from the finalised question set was 0.869, and the highest was 0.887.

One inclusion item, "*I feel uncomfortable voicing my opinion among other faculty and administrators at my college/school of pharmacy*", had a corrected item-total correlation of 0.498, and the antiracism item "*I feel that there is workplace discrimination on the basis of race or ethnicity at my college/school of pharmacy*" had a corrected item-total correlation of 0.436 - both of which were below the target of 0.5. Removal of the inclusion item would impact the Cronbach's alpha for the inclusion domain by 0.005 and the overall scale by 0.003. The removal of the antiracism item would impact Cronbach's alpha for the antiracism domain by 0.027 and the overall scale by 0.003. The team decided to keep both items since they were only slightly below the target, and their removal would only minimally impact the reliability of the domain or overall scale.

The only item removed was the duplicate item in the antiracism domain in a manner consistent with the faculty version of the survey (Wollen *et al.*, 2023). The items removed in the faculty analysis were not analysed for consistency in the staff survey.

Table I: Principal component analysis by component

Diversity domain	***h*²**	**F4**	**CITC**
a = 0.951 r^2 (%) = 7.082			
I feel that my racial/ethnic identity is adequately represented at my college/school of pharmacy among staff.	0.928	0.937	0.907
I feel that my racial/ethnic identity is adequately represented at my college/school of pharmacy among faculty and administration.	0.928	0.944	0.907
Equity domain	***h*²**	**F1**	**CITC**
a = 0.764; r^2 (%) = 41.350			
I feel that I am treated fairly compared to other staff at my college/school of pharmacy.	0.480	0.559	0.476
I feel that I am adequately supported for professional success compared to other staff with similar responsibilities at my college/school of pharmacy.	0.758	0.846	0.684
I feel that my opportunities for leadership and career development are similar to that of other staff at my college/school of pharmacy	0.683	0.710	0.655
Inclusion domain	***h*²**	**F2**	**CITC**
a = 0.820; r^2 (%) = 12.540			
I have considered leaving my college/school of pharmacy because I feel isolated or unwelcomed.*	0.668	0.660	0.694
I feel that I belong at my college/school of pharmacy.	0.762	0.785	0.745
I have found one or more communities, groups, or spaces at my college/school of pharmacy where I feel welcomed.	0.665	0.800	0.541
I do not feel marginalised or excluded at my college/school of pharmacy.	0.600	0.541	0.646
I feel uncomfortable voicing my opinion among faculty and administrators at my college/school of pharmacy.*	0.408	0.445	0.498
Antiracism domain	***h*²**	**F3**	**CITC**
a = 0.794 ; r^2 (%) = 9.314			
I feel that there is workplace discrimination on the basis of race or ethnicity at my college/school of pharmacy.*	0.650	0.760	0.436
I feel that racial tension is present at my college/school of pharmacy.*	0.717	0.709	0.613
I feel that I have experienced microaggressions on the basis of race or ethnicity at my college/school of pharmacy.*	0.789	0.681	0.673
I feel that I have experienced overt macroaggressions on the basis of race or ethnicity at my college/school of pharmacy.*	0.803	0.679#	0.716

*Reverse scored question; #Loaded to F1 at 0.502

CITC = corrected item-total correlation; a = Cronbach's alpha; r2 = percent of variance explained; h2 = principal component analysis communality extraction; F = loaded component

Discussion

The aim of this study was to create and validate a standardised survey tool to assess staff perceptions of the DEIA climate among pharmacy higher education institutions in the United States. The survey scale was highly reliable across all domains. Cronbach's alpha for the 16-item survey was high in all four domains, each of which was assessed using multiple questions to achieve a balance between conciseness and comprehensiveness. The high internal consistency in the diversity category may be due to the limited number of survey items in that category. In addition, the corrected item-total coefficient was used to define the association of the item with the total score on the other items, and the presence of a high item-correlation coefficient ranging from 0.436 to 0.907 provides empirical evidence that the item is measuring the same construct measured by the other items included. The high values of Cronbach's alpha and corrected item-total coefficients support the strong consistency and reliability of the survey items. Each domain within the tool had questions that were discriminatory within them. It is noteworthy, however, that the items loaded more strongly to the domains and had less variance in the faculty version of the survey. This is likely due to the significantly greater sample size and one additional question in the equity domain having to do with promotion and tenure that was not included in the staff survey. This tool can be utilised as a scale for each of the four domains separately and/or together as a DEIA perception scale. This can be utilised by pharmacy higher education institutions to assess their pharmacy staff's perception of the DEIA climate at their institution. Although this study was based in the United States, its methodology and findings can be adapted and applied to pharmacy institutions worldwide, providing a valuable framework for enhancing DEIA efforts globally.

Diversity domain

Within the realm of pharmacy higher education institutions, there is a noticeable gap in the literature pertaining to diversity, specifically the adequate representation of various demographic groups among staff members (Nkansah *et al.*, 2009). While the ACPE standards and guidelines provide clear directives regarding the importance of diversity goals in the values of pharmacy education institutions, as well as their consideration in the recruitment of faculty members, staff, and students, there is a pressing need to utilise a standardised and validated tool to assess the needs of these individuals (Accreditation Council for Pharmacy Education, 2015). The benefits of fostering a diverse staff workforce at the structural and organisational level extend beyond mere compliance; these highly visible positions hold the potential to significantly influence students' perceptions of campus inclusivity and recruitment of diverse students (EVERFI, 2017; Nkansah *et al.*, 2009). By promoting diversity within staff ranks, academic pharmacy institutions can not only meet accreditation requirements but also create an inclusive and welcoming environment that resonates with prospective students from varied backgrounds and thereby contributes positively to the broader landscape of pharmacy practice.

The two items included within the diversity domain are focused on adequate representation of racial and/or ethnic identity within the pharmacy higher education institution. The two items vary regarding whether a staff member perceives adequate representation among other staff colleagues versus among pharmacy faculty and administration, as one can exist without the other. It is important to note that there is a limited representation of the diversity construct within this domain due to two other items being excluded. The team made the decision to remove the items due to loading onto incorrect or unintended components in the faculty analysis and removed these items prior to analysing the staff version of the survey. The finalised factor analysis produced a total of only 7.082% variance, which was expected due to the limited items in the scale. Additionally, the high alpha value of 0.951 in the diversity domain might be due to the limited number of items. Further studies are needed to increase the item factors of the diversity domain to increase both construct validity and improve effect size.

Equity domain

Equity among staff members in higher education institutions is a fundamental pillar of creating an inclusive and thriving academic environment. It goes beyond mere diversity numbers and delves into ensuring that individuals from all backgrounds have equitable access to opportunities, resources, and support systems within the institution (Arif *et al.*, 2023). Achieving equity in staff positions is essential because it promotes fairness and reduces systemic barriers that may hinder professional growth and advancement for underrepresented groups (Arif *et al.*, 2023).

A study of the employment demographics at ten public colleges found that minority staff comprised 35% of management-level non-teaching positions, although minority students made up about 58% of the student body (EVERFI, 2017). Minority staff members were overrepresented in the lowest job classifications and underrepresented in the highest at these universities (EVERFI, 2017). This disparity in job classifications underscores the pressing need for addressing equity issues among staff in higher education institutions. In response to these concerning findings, one university

took proactive steps to rectify the situation by initiating a training and mentorship programme aimed at connecting lower-level minority staffers with senior-level executive administrators (EVERFI, 2017).

The equity domain contains four items that determine staff members' perceptions of being treated fairly, receiving adequate support, and having an equal chance to succeed as their colleagues. Additionally, the equity domain also assesses if staff perceive they have opportunities for leadership and career advancement within their academic institution. The finalised factor analysis produced a total of 41.350% variance, which was the highest value of all domains. This suggests that there is a strong effect size (Field, 2018). Additionally, the Cronbach's alpha was 0.764, which suggested strong reliability (Field, 2018).

Inclusion domain

Higher education institutions should strive to create inclusive communities that facilitate the holistic growth and development of members in their organisations. When staff members from diverse backgrounds are genuinely included and valued, it fosters a sense of belonging and commitment to the institution's mission (Martinez-Acosta & Favero, 2018). Feeling welcomed and respected enhances job satisfaction and psychological well-being, which is a crucial factor in staff retention (Solis-Grant *et al.*, 2023). Additionally, when staff feel comfortable expressing their ideas and concerns, it promotes a culture of open communication and innovation. This not only contributes to staff members' personal and professional growth but also positively influences the institution's overall performance and adaptability to changing needs (Martinez-Acosta & Favero, 2018).

The inclusion domain contains five items that assess staff members' perceptions of belonging, isolation, marginalisation/exclusion, and comfort in voicing opinions among colleagues at their institution. The finalised factor analysis of the equity domain produced a total of 12.540% variance. Additionally, there was high internal consistency as evidenced by Cronbach's alpha of 0.820.

Antiracism domain

Anti-racism addresses actively combatting racism and promoting racial justice and equality. The impact of discrimination and racial tension within educational institutions is profound and far-reaching. Racism, whether expressed through microaggressions or macroaggressions, significantly affects the recruitment, retention, and overall well-being of staff members (Okorie-Awé *et al.*, 2021). Microaggressions, often subtle and unintentional, can create a hostile work environment, undermining staff morale, self-esteem, and job satisfaction (Compton-Lilly, 2020). Such experiences of daily discrimination can lead to heightened stress, burnout, and diminished performance, which can ultimately drive talented staff away from these institutions (Compton-Lilly, 2020). Conversely, macroaggressions, overt and explicit racial discrimination, can have immediate and severe consequences that can lead to alienation (Compton-Lilly, 2020; Solorzano *et al.*, 2000). These racial tensions not only harm individual staff members but also hinder the broader institutional mission, as a lack of diversity and inclusion can deter students, damage the institution's reputation, and reduce its capacity to adapt to an increasingly diverse society. Addressing racism and promoting an inclusive environment is not only a moral imperative but also essential for staff retention and the long-term success of higher education institutions (Compton-Lilly, 2020; Solorzano *et al.*, 2000).

Considering the significance of cultivating an environment that opposes discrimination, the four components within the antiracism domain centre on essential elements related to racial discrimination, encompassing staff's viewpoints on subjects like workplace bias, racial tensions, microaggressions, and macroaggressions. By including the items in this domain, pharmacy higher education institutions can assess the antiracism climate within their institution. These findings indicate a finalised factor analysis of 9.314% variance within the antiracism domain. Additionally, there was high internal consistency, as evidenced by Cronbach's alpha of 0.794.

Limitations

This study presents certain limitations that warrant consideration. Firstly, an inadvertent survey question duplication was discovered, resulting in the exclusion of responses to the duplicated question during the analysis phase, with only the initial response to this question being analysed. Secondly, in the diversity section, two questions were omitted due to their alignment with incorrect or unintended components, leaving just two remaining questions to assess diversity. This reduced coverage of the diversity construct may have constrained the depth and comprehensiveness of findings within that section. Thirdly, the study opted for a fixed factor approach rather than employing eigenvalues, as the DEIA domains were predetermined. Lastly, it is noteworthy that this study's employed scale lacks validation against other existing scales, given the absence of validated DEIA scales within the field. This absence of comparative validation limits the capacity to establish the scale's convergent or discriminant validity.

Upcoming endeavours will involve the reporting of staff responses and the exploration of factors influencing scores. A survey tailored to pharmacy education faculty has already been distributed, and the team is currently engaged in the validation of this survey and the examination of the results. As part of the ongoing validation of survey tools, the team is actively seeking prospects to conduct revalidation with supplementary questions, with a particular focus on the diversity domain. Furthermore, the team aspires to develop and validate a survey version to assess perceptions of DEIA among students.

Conclusion

The factor analysis demonstrated strong associations with the four components, acting as a decisive factor in determining which items were included or excluded from the scale. The reliability analysis revealed a high level of consistency within each domain and for the entire scale. Each domain in the tool contained questions that effectively discriminated among the variables being measured. This indicates that the refined scale effectively assesses 1) institutional perceptions of each DEIA domain and 2) overall institutional perceptions of DEIA, with psychometrically sound and dependable items in each category, making it a valuable instrument for evaluating how pharmacy staff perceive their institution.

Conflict of interest

The authors declare no conflict of interest.

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