Supplemental Table 1. Data extraction

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| **1st author**  **Year**  **Country** | **Study purpose** | **Study Design** | **Setting and Sample** | **Measures Used** | **Results** |
| Braun  2015  USA | Examine nurses’ implicit perceptions of surgeons with a focus on whether nurses held an implicit preference for surgeon gender, gender-normative demeanor, or type of surgery | Quasi-experimental Survey | Hospital, N = 493, RNs inpatient nursing units, the operating room, and the emergency department  41% of respondents worked in Medical/Surgical Acute Care units; 29% worked in Critical care units; 6.8% in the Emergency Department; and 9.0% in the operating room.  66/7% worked with pediatric patients, and 17.2% worked in settings with both adult and pediatric patients. | Respondents answered five questions using a Likert scale of 0, “not at all,” to 5, “very much.”  Five-item surgeon perception scale varied in eight possible descriptions of the surgeon – gender, demeanor, and specialty. Using a 0 to 5 scale, respondents rated their perception of the surgeon for each item. | Registered nurses preferred communal surgeon (orientation towards group success, cooperative, polite, and humble) over agentic surgeon (assertive, high self-esteem, competitive).  There was no significant preference for gender or surgery type.  OR nurses rated surgeons the highest, and ED nurses ranked them the lowest. |
| Bristol  2018 USA | Evaluate the emergency department healthcare team's knowledge and attitudes toward Lesbian, Gay, Bisexual, and Transexual (LGBT) people pre- and post-cultural competency training | One group pre-test/post-test design  Survey | Hospital N=135  Emergency room nurses, nurse practitioners, unit secretaries, and physicians.  n=95 pre-intervention  n=40 post-intervention participants. | The Ally Identity Measure (AIM) assessed three domains - knowledge and skills, openness and support, and oppression awareness  Pre/Post LGBT cultural competency training workshop  Participants were asked to complete the AIM instrument twice - before cultural competency training and 3-5 months later | AIM survey revealed a statistically significant difference between the pre-post intervention group.  Pre-survey data revealed that 85.3% (n=81) of staff had no previous LGBT education specific to the population's needs.  Post-survey data collected 3-5 months after the education intervention showed a total index mean increase of 8.8% in knowledge and skills, openness and support, and awareness of oppression regarding the LGBT community.  Overall, the AIM index increased in the post-intervention group in all three domains with the most significant gain in knowledge and skills. |
| Colon-Emeric,  2017  USA | Study implicit bias in nursing home fall prevention practices by gender, race, or age.  Determine whether individualized care delivery is affected by implicit bias in staff characteristics | Randomized factorial clinical vignettes survey | 16 Nursing Homes  N= 433 registered nurses, licensed practical nurses, unlicensed staff (nurse aids, rehabilitation aides, and social workers) | Four (4) vignettes describing hypothetical residents from a matrix of clinical and demographic characteristics.    The Agency for Health Research ad Quality Management Program- Fall quality improvement intervention.    Four intervention categories:  1) environmental modification  2) medication review  3) exercise/rehabilitation  4) medical condition management  Participants completed four vignettes - two vignettes before AHRQ Falls Training and two post-training. | Nursing home staff report a standardized approach to fall prevention for all residents regardless of their specific clinical characteristics.  Staff had a small degree of implicit racial bias, indicating that environmental modifications would be less likely to occur when identical vignettes included a photo of a Black resident rather than a White resident.  No implicit bias of gender or age.  RNs higher likelihood of fall prevention activities than did LPNs, unlicensed staff, and other professional staff. |
| dos Santos Silva  2016  Brazil | Analyze nurses' knowledge from the Family Health Strategy about sexual diversity and homophobia. | Exploratory, qualitative | State of Rio Grande do Norte, Brazil  12 professional nurses; 5 males, seven females;  11 – 20-29 yo  1 - > 30 yo  Nurses were part of Brazil’s Family Health strategy, a national primary care community health initiative | Semi-structured interviews (recorded)  Analysis – Disclosure Analysis (AD)  Discourse Analysis of semi-structured interviews | Sexual diversity – Sexual diversity may be granted when it is possible to understand and accept that humanity has biological similarities, but concerning social conventions adopted by each community and culture/Homophobic prejudice - is discriminatory actions perpetrated against individuals of sexual diversity, primarily LGBT.  Conclusion - the silencing of the cultural background of the subjects may be linked to an academic background curative/biologizing where little is considered the social determinants in the health-disease process and contribute to the implicit and explicit expression of prejudice formulated as homophobia.  Nurses showed little to no knowledge of sexual diversity in this study, viewing it in terms of sexual orientation and biological sex and lacking an understanding of the socio-psycho-cultural aspects and their impact on health.  Authors conclude that work is needed to help nurses and other health professionals view implicit and explicit bias against Lesbian, Gay, Bisexual and Transgender individuals as a social determinant of health and incorporate knowledge of the impact of implicit and explicit bias into their practice. |
| Haider 2015 USA | Investigate implicit bias, race, and social class preferences among surgical registered nurses. | Prospective Study using IAT survey and eight multi-stage clinical vignettes | Hospital,  N= 245 Surgical Registered Nurses  Participants by specialty:   * 54 ED (22%) * 37 acute care (15%) * 151 ICU (62%) | Implicit Association Testing (IAT) for social class and race.  Eight (8) clinical vignettes in which the patient’s race or social class were randomly altered.  Vignettes were followed by implicit association tests (IATs) for both race and social class and by explicit questions about race and social class preferences. | On the IAT assessment, most RNs displayed implicit preferences toward the white race and upper social class patients.  The implicit biases among Rs did not correlate with clinical decision-making.  The majority of RNs displayed implicit preferences toward white race and upper social class patients on IAT assessment.  Implicit biases among RNs did not correlate with clinical decision-making. |
| Halverson 2019 USA | Explore providers' attitudes toward children with obesity and patient and family perception of weight bias in the hospital. | Mixed Methods | Hospital  n=10 Ped. hospitalist  n= 10 Residents  n= 8 Acute care nurses  n=12 Patients  n= 12 parents guardians | Quantitative data on implicit and explicit weight bias of medical providers.  The weight Implicit Association Test (IAT) and Crandall’s  Explicit Anti-Fat Questionnaire.  Qualitative data  Semi-structured interviews with medical providers about their feelings toward children with obesity and perceptions of differences in care providers. | 71% of healthcare providers had moderate or strong implicit weight bias with no significant difference between provider types.  Healthcare providers had low scores for explicit bias, indicating neutral to moderate disagreement with negative statements about patients with obesity.  Qualitative: 7 themes around the impact of weight status on hospital care and perceptions of weight bias.  -Children do not have full responsibility for their own obesity.  -Weight bias exists, both in and out of the hospital.  -Potential for provider bias toward parents of pediatric patients with obesity.  -Weight affects inpatient care  -Obesity may be addressed in the inpatient setting  -Terminology for addressing obesity is important  -Preference for obesity to be addressed in the outpatient setting. |
| Hwang  2021  32 | Quality of gerontological nursing and ageism: What factors influence nurses' ageism in South Korea | A descriptive and correlational study | 162 general hospital nurses | Questionnaires:  the Wong and Law Emotional Intelligence Scale (WLEIS)  Contact with Elderly People (CEP)  the Anxiety about Aging Scale (AAS),  the Fraboni Scale of Ageism (FSA) | The average FSA score is 2.63 ± 0.36, showing a statistical difference comparing those with/without cohabitation with an old adult in the past.  Factors influencing FSA: fear of older adults and fear of loss. |
| Liang  2019  USA | Examine gynecologic oncology care providers’ implicit prejudice and stereotyping toward cervical cancer patients | Descriptive Correlational Survey | Members of professional gynecologic oncology organizations  N= 151  n=93 physicians  n= 58 nurses | Two (2) Implicit Association Tests (IATs)   * Implicit prejudice (negative emotions). * Implicit stereotypes (negative beliefs)   External and Internal Motivation to Respond Without Prejudice Scale used to measure explicit motivations to be non-prejudiced against women with cervical cancer | Gynecologic oncology providers showed significant levels of implicit prejudice toward cervical cancer patients.  Healthcare providers showed significant levels of implicit stereotyping of cervical cancer patients.  Physicians did not demonstrate significant levels of implicit bias; nurses showed greater levels of implicit prejudices and stereotyping.  Providers without cultural competency or implicit bias training demonstrated greater bias than those who completed training. |
| Melia 2016  Indonesia | Explore the relationships between nurses’ characteristics (age, gender, education, and experience), ageism, perception of older people's care, and nursing practice for hospitalized older people. | Descriptive correlational study | 120 nurses using simple random sampling from two hospitals in Bandung, West Java. | Four questionnaires:  1) the Demographic questionnaire,  2) the Professional Development of Registered Nurse (PDRS), an instrument to measure nursing practice,  3) the Fraboni Scale of Ageism (FSA), and  4) Nurses’ Perception of Care questionnaire. | Nurses showed moderate level of ageism and high perception of older people care.  Age, gender, and experience were positively related with nursing practice for hospitalized older people. |
| Moceri  2014  USA | Increase understanding about how bias was experienced through the descriptions of Hispanic nurses. | Mixed methods  Cultural Safety Framework | A convenience sample of 111 Hispanic nurses from across the country. | Participants wrote about any bias they may have experienced and described negative comments they might have heard about their personal characteristics, including race or ethnicity.  Content Analysis | Three themes emerged: Being overlooked and undervalued, having to prove competency, and living with “only-ness.” Respect was an overarching concept.  Importance of developing and implementing strategies to support Hispanic nurses more effectively and promote nonbiased interactions in the workplace.  Retaining Hispanic nurses is a vital component of addressing issues of health inequity for Hispanic patients.  The authors identify several action steps that could be initiated based on participant responses. They include (a) promoting an unbiased climate, (b) confronting racism, (c) rewarding Hispanic and URM nurses, and (d) hiring a critical mass of Hispanic and other URM nurses. Systematically tying these to an organization’s antidiscrimination goals would make these strategies even more effective. |
| Purtzer  2019  USA | Gather anecdotal evidence suggesting that racism negatively impacts the nursing care of the Native American patient/ understanding parameters of the patient/nurse relationship in the context of Native American health. | Descriptive‐qualitative  Leininger's Theory of Culture Care Diversity and Universality | Eleven nurses employed at public and Native American-owned or managed health care institutions/facilities located either within the boundaries of a western reservation or had a service area within this boundary; ranged in age from 39 to 67, were mostly female and lived in the county for an average of 30 years (range=4–67). | Semi‐structured phone interviews  Thematic analysis | Interrelated themes: shared patient/nurse values, patient‐centered care, external forces, and stereotype‐driven care.  Implications for public health nursing include being intentional about recognizing implicit biases and ethnocentrism, examining nurses’ complicit roles in perpetuating racism, and developing mechanisms to collectively advocate for improved Native American health.  Participants spoke of other nurses who demonstrated prejudicial attitudes and behaviors, and yet none of the nurses reported evidence of their own bias. |
| Rababa  2020  Jordan | * Examine the correlation of Jordanian nurses’ sociodemographic and professional characteristics and their knowledge, attitudes, and ageism toward older adults. | A descriptive, correlational, cross-sectional design | 317 Jordanian nurses | the Fact on Aging Quiz 1, Fraboni Scale of Ageism, and Relating to Older People Evaluation | Nurses showed significant ageism and had different levels of knowledge, attitudes, and negative ageism based on the sociodemographic/professional characteristics.  Nurses’ knowledge and attitudes toward older adults significantly correlated with negative ageism, which was associated with poor health outcomes for older adults. |
| Robstad  2018 Norway | * Examine intensive care nurses' implicit and explicit attitudes toward obese intensive care patients. * Determine whether their attitudes are associated with behavioral intentions toward obese patients | Cross-sectional Survey | Web-based survey from 16 intensive care units and Facebook.    N= 159 Intensive care nurses from 15 hospitals and 1 Facebook group. | Implicit Attitude test measuring attitudes and stereotypes about thin and thick people with weight-related ‘good’ or ‘bad’ attribute words.  Four (4) Explicit bias Anti-bias scales rating feelings about  a) thick and thin people as ‘bad versus good.’  b) stereotypical beliefs as ‘lazy versus motivated.’  c) worthless versus valuable.’  d) and ‘stupid versus smart.’  The anti-Fat Attitude  questionnaire consists of 13 statements measuring prejudice against obese people.  The behavioural intention was measured through vignettes.   * Demographic questions include sex, age, certification, years of work experience as a qualified ICU nurse, and self-perceived weight (i.e., very underweight, underweight, normal weight, overweight, or very overweight. | Intensive care nurses reported implicit preferences for thin over thick people.  ICU nurses reported explicit tendencies in favor of thin over thick people based on the ‘bad and lazy’ perspective. However, no attitudes were associated with behavioral intention.  No significant between-group differences in implicit and explicit attitudes related to self-reported weight stature.  AFA scores revealed that nurses seemed to find it easier to report that obese patients had less willpower than report that they disliked these patients.  ICU nurses scored ‘willpower’ and ‘fear’ higher than the ‘dislike’ subscale.  Male nurses reported higher scores on the AFA willpower subscale than female nurses.  ICU nurses reported behavioral intention scores where a higher score indicates a higher intention to help the obese patient.  No attitude measures in the regression analysis were associated with behavioral intention indicating that ICU nurses’ attitudes did not seem to influence their behavioral intentions |
| Sabin  2015  USA | Describe implicit and explicit attitudes toward Lesbian and gay men among health professionals. | Exploratory secondary analysis of Sexuality IAT results  Survey | Online/public website, Project Implicit  N= 247,030  medical doctors, nurses, mental health providers, treatment providers, and people who work outside health professions, both in the United States and internationally. | Sexuality Implicit Association Test (IAT) | Healthcare providers have implicit preferences for heterosexual people versus lesbian and gay people among heterosexual health care providers.  Heterosexual men showed a stronger implicit preference for heterosexual people than heterosexual women.  Heterosexual male and female nurses both showed strong preferences for heterosexuals over lesbian and gay people.  Lesbian and gay providers held implicit and explicit preferences for lesbian and gay people over heterosexual people.  Patterns of implicit preferences were mixed among bisexual providers and non-providers.  Among all providers, heterosexual male nurses held strong implicit preferences for heterosexual women.  White test-takers showed a less implicit and explicit preference for heterosexuals over lesbian and gay people than most groups of Black/African American, Asian, ad Hispanic test-takers.  Asian mental health providers showed little implicit preference for heterosexual women and no explicit preference for heterosexual people. |
| Schroyen  2016  Belgium | Replicate the results of previous studies that reported differential support of medical treatment depending on the patient's age in a different healthcare provider population (nurses rather than physicians)  Determine whether support for expensive immunotherapy, adjuvant chemotherapy, or breast reconstruction is linked to ageism among nurses. |  | 76 nurses who specialized in oncology | Clinical vignettes; also assessed “intuitive” measure of attitude and explicit measure | Our analyses show that support for immunotherapy, breast reconstruction, and chemotherapy is lower for older patients than for younger patients. Moreover, nurses' vision of aging influences support for breast reconstruction: nurses with a negative view of age discriminated more between a 75-year-old patient and a 35-year-old patient (less encouragement for the older patient). |
| Sukhera  2018a  Canada | To explore how health professionals perceive the influence of the experience of taking the Implicit Association Test (IAT) and receiving their results. | Constructivist grounded theory | Twenty-one pediatric physicians and nurses at the Schulich School of Medicine and Dentistry; Four of 21 participants (19%) were male, and 17/21 participants (81%) were female; 15/21 (71%) participants shared that their result demonstrated implicit dangerousness bias toward mental illness. | Semi-structured interviews | Participants described tensions between acceptance and justification and how IAT results relate to idealized and actual personal and professional identity. Participants acknowledged the desire for change while accepting that change is difficult.  Reflection informed by tensions between actual and aspirational aspects of professional identity may hold potential for implicit bias recognition and management curricula.  Themes:   * Acceptance versus justification * Idealized versus actual personal and professional identity * Desire to change while acknowledging that change is difficult |
| Sukhera  2018b  Canada | To explore how individuals and workplace learning environments influence each other to produce change following a learning activity that disrupts workplace norms. | Constructivist grounded theory/ longitudinal  qualitative case study  Instrumental case study  Constant comparative analysis | Purposeful theoretical sample –  10 physicians  11 nurses  10 agreed to participate in longitudinal interviews and 4 participants agreed to participate in a single interview approximately 12 months after the intervention.  Of these 14 participants, 7 were nurses, and 7 were physicians. | Longitudinal, semi-structured interviews over 12 months  4h learning activity for practicing physician and nurse attendees, which was informed by research suggesting that implicit labeling and avoidance behaviors by health providers are perceived as discriminatory by patients and caregivers; used to design a curriculum that included didactic lecture, group discussion, role play, debriefing and self-refection exercises | Implicit bias recognition provokes dissonance among participants leading to frustration and critical questioning of workplace constraints.  Once awareness was triggered, participants began reflecting on their biases and engaging in explicit behavioral changes that influenced the perception of structural changes within the learning environment.  Collaboration, communication, and role modeling within teams appeared to facilitate the process as individual and workplace affordances were gradually transformed.   * Awareness triggers frustration, highlighting workplace constraints * Once the bias is recognized, participants adapt through explicit changes in behavior * Behavior changes are reinforced through communication, collaboration, and role modeling among peers * When confidence increases, some individuals become affordance |
| Sukhera  2019  Canada | To explore how mental health professionals process and integrate feedback about implicit bias that might be perceived as threatening. | Constructivist grounded theory  feedback intervention theory | 32 psychiatry nurses, psychiatrists, and psychiatric residents  11 psychiatric nurses  10 practicing psychiatrists  11 psychiatry residents | Semi-structured interviews  Constant comparative analysis | Most participants critiqued the IAT and questioned its credibility. Many also described the experience of receiving feedback about their implicit biases as positive or neutral. Most justified their implicit biases while acknowledging the need to better manage them.  Key themes: Criticizing, questioning validity, questioning accuracy, accepting, reflecting, acting upon.  These findings highlight a feedback paradox, calling into question assumptions regarding self-related feedback.   * 32% demonstrated implicit dangerousness bias against mental illness * 55% demonstrated implicit dangerousness bias against physical illness * 13% demonstrated no implicit bias against either * 42% viewed their results as expected * 58% viewed results as Unexpected |
| Tajeu  2018  USA | Investigate differences in implicit racial bias among healthcare workers by race ad occupation using Implicit Association Test (IAT).  Explore differences in explicit bias by race and occupation using the Modern Racism Scale (MRS).  Determine if correlations between explicit and implicit bias differ based on race or occupation. | Survey | Online/Web-based using Alabama-based primary Care Research Coalition.  N=107  medical doctors,  registered nurses, and  non-MD/RN medical staff (receptionists). | Implicit bias using race-based Implicit Association Test (IAT)  Explicit bias by race and occupation using the Modern Racism Scale (MRS). | Implicit bias scores were higher among Whites compared with Blacks and Other participants. The majority of participants were white, female, had at least some college education, and were predominantly non-MD/RN staff.  Among Whites, non-MD/RNs demonstrated more pro-white implicit bias compared with MD/RNs.  Among MD/RNs, Whites had the highest level of pro-White implicit bias compared with others and Blacks.  Whites had higher explicit bias scores than Blacks.  Higher levels of pro-white implicit bias and explicit bias towards blacks among white participants  Differences in implicit bias by occupation among white participants, with white non-MD/RN staff having higher levels of pro-white implicit bias compared with white MD/RN  When adjusted for sociodemographic characteristics, racial differences in implicit bias remained; however, there was no statistically significant difference in IAT score between non-MD/RN and MD/RN staff |
| Waller  2012  USA | To determine the implicit or unconscious attitudes of Nursing and Psychology majors towards overweight individuals in medical and non- |  | 90 students from Nursing (n = 45) and Psychology (n = 45) | A computerized implicit association test was used to determine implicit attitudes toward overweight individuals in medical and non-medical contexts. | A statistically significant implicit bias towards overweight individuals was detected in both subject groups and in both target settings (medical vs. non-medical). More substantial weight bias was found when the stimulus targets were female than male |