

## The Attitudes of Palestinian Healthcare Students Towards People with Disabilities: Designing and Statistically Validating an Inventory

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**Abstract:** Background: People with disabilities (PWDs) often face negative attitudes and limited inclusion in healthcare settings. While international tools exist to measure healthcare student attitudes toward PWDs, few are validated for Arabic-speaking populations. To translate, culturally adapt, and validate an Arabic-language scale assessing healthcare students' attitudes and interactions with PWDs. Methods: A cross-sectional survey was conducted among 200 healthcare students in Palestine. The original English scale was translated and back-translated into Arabic. Exploratory factor analysis (EFA) was used to identify the underlying structure. Internal consistency was assessed using Cronbach's alpha. We also examined associations between Attitudes toward PWD Inventory scores and sociodemographic variables. Results: The Arabic version showed good internal consistency (Cronbach's alpha = 0.86). EFA revealed two factors—Attitude and Interaction—explaining 48.3% of the total variance. The scale demonstrated good construct validity and was well understood by participants. Disabled healthcare students had significantly more positive attitudes than their peers ( $p = 0.006$ ). No significant differences were found by gender, field of study, or level of contact with persons with disabilities. Conclusions: The adapted Arabic-language instrument is reliable and valid for assessing attitudes toward PWDs in healthcare students. It may be used to inform educational interventions and promote inclusion in clinical settings, especially in under-resourced and conflict-affected regions.

**Keywords:** People with disability, Healthcare students, attitude, interaction, Questionnaire.

### Introduction

Globally, slightly more than 1.5 billion people suffer from severe disabilities. This is one in every six individuals, or 16% of the world's population (1). Perceptions towards people with disabilities (PWDs) vary greatly depending on cultural, societal, and individual factors. While there has been progress in promoting inclusivity and reducing stigma in many parts of the world, people with disabilities often face discrimination, prejudice, and misconceptions.

People may perceive PWDs as objects of pity or sympathy, viewing them primarily in terms of their limitations and challenges rather than their abilities and strengths (2). On the other hand, PWDs are sometimes portrayed as inspirational figures or heroes, admired for their resilience, determination, and ability to overcome obstacles (3).

PWDs may be unfairly perceived as inferior or less capable than their non-disabled peers, leading to marginalization, exclusion, and limited opportunities for participation in society (4). Bullying is twice as common among children with special education needs (SEN) compared to those without (5). Some individuals may view disabilities as burdensome, both for the individuals themselves and for their families or caregivers, contributing to negative attitudes and reluctance to accommodate or support people with disabilities (6).

Research investigations have unveiled that healthcare professionals maintain negative perspectives regarding PWDs and exhibit insufficient expertise and competencies in delivering services. The quality of healthcare services can be impacted by various factors, including healthcare professionals' learning opportunities, social environment, and attitudes and opinions

toward PWDs (7–9). A research endeavor investigated physicians' views regarding implicit bias, which can result in inequitable healthcare for patients with disabilities. According to lezzoni et al., physicians reported comparable feelings of unease and distress when interacting with and treating patients with disabilities. Concerningly, the study's results demonstrated that these biases may influence medical students who might be affected as they enter the workforce as practicing physicians (10).

Literature has expressed concern regarding the lack of research on the perspectives of healthcare students regarding patients with disabilities. There are still substantial gaps in the current understanding of nursing students' attitudes and the factors that influence them in Turkey. Changing nurses' attitudes towards PWDs is a significant function of nursing education. There is no mandatory subject in the current undergraduate curriculum that prepares student nurses to provide care for disabled individuals (11). In Greece, there were negative attitudes towards individuals with physical disabilities. Medical studies, advanced knowledge, and work with individuals with physical disabilities were associated with slightly more positive attitudes. Attitudes were not associated with gender or age. Nursing students exhibited slightly less positive attitudes towards intellectual disability across multiple subscales (12).

Before October 7, 2023, available data indicated that the estimated number of PWDs in Palestine was approximately 115,000, or 2.1% of the total population; the disability rate among adults (18 years and older) had risen to 3%; the number of individuals with disabilities in the Gaza Strip has doubled; and

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approximately three out of every twenty-five children have one or more forms of functional difficulties (13).

The Palestinian government's healthcare policies for people with disabilities focus on non-discrimination and ensuring equal access to healthcare, education, and employment. Palestinian law guarantees these rights, but enforcement remains inconsistent, especially in Gaza, where accessibility to public institutions and infrastructure is often inadequate. For example, many public buildings and streets are not equipped with ramps or other necessary modifications for people with physical disabilities (14). The Palestinian Ministry of Health provides disability-related training for healthcare professionals, along with international organizations that provide specialized training on disability inclusion, aiming to equip healthcare providers with the skills to manage and support people with disabilities, especially in contexts where infrastructure and healthcare resources are limited (14,15). As for the healthcare curriculum, inclusion-related topics are gradually being integrated into medical and nursing programs. However, there is a need for more comprehensive education on disability rights and inclusive healthcare practices in the curricula across Palestinian medical institutions. This would ensure future healthcare providers are better prepared to meet the needs of people with disabilities (15).

There is very little data and study on disability-related health in Palestine and the region, which may reflect a lack of concern, awareness, or interest in the field. Nonetheless, it is critical to identify the perspectives of various healthcare undergraduates regarding individuals with PWDs.

In this context, various validated instruments have been designed to test the attitudes of healthcare staff towards people with disabilities, including the Attitudes Toward Disabled Persons Scale (ATDP), one of the most widely used instruments developed in the 1960s. It assesses general attitudes toward disabilities and has been tested for reliability and validity in various contexts (16); the Interaction with Disabled Persons Scale (IDP) focuses on measuring discomfort felt by non-disabled individuals when interacting with people with disabilities. It has been validated internationally and used with different healthcare student groups (17). The Contact with Disabled Persons Scale (CDP) evaluates both the quantity and quality of previous contact with disabled individuals, incorporating affective responses as part of the measurement (18), and the Rehabilitation Situations Inventory (RSI) is tailored for rehabilitation professionals and assesses behavioral challenges they face while working with disabled individuals (19). This study aimed to develop and validate a reliable Arabic-language instrument and to describe the attitudes of healthcare students toward people with disabilities using a cross-sectional survey.

## Materials and Methods

### Study design and setting

In this work, we focus on three phases: (1) Instrument development, (2) validity of the work, (3) cross-sectional survey. This study had institutional review board approval, and all respondents gave consent.

### Instrument Development

The tool was built based on an extensive literature review (20,21). The research took advantage of several tools created to gauge PWDs' happiness and level of engagement with vocational rehabilitation (VR) programs. The instrument was developed by the authors through adaptation and integration of items from several validated scales, including tools by Capella

and Turner, Dutta et al., and Al-Rashaida et al.(22–24) It was not a direct translation of a single original instrument but rather a context-specific tool tailored to healthcare students in Palestine.

The instrument was designed in English and consisted of three sections. The first section comprised the core demographic and socioeconomic questions. A yes, no question assessed if the participants had a disability or had contact with PWDs, and if the participant answered yes on the later, more details about the relation with that PWDs if it is family, a relative, close friend, classmate, or others. The second section focused on participants' attitudes toward PWDs, utilizing a 4-point Likert scale (1= strongly disagree, 2= disagree, 3= agree, and 4= strongly agree). The attitude inventory consists of 25 statements assessing different aspects of perception towards PWDs, such as how the participant thinks PWDs would feel for themselves (sorry, happy, worried, easily upset, grouchy, expecting special treatment) if PWD people were the same as anyone else, and if the participant is comfortable being around or deal a person who has any disability and if he/she thinks that PWD should have special schools, to lead an everyday life. The third section assessed participants' contact with PWD utilizing a 5-point Likert scale (1 = never; 2 = once or twice; 3 = a few times; 4 = often; 5 = very often) through having met, having a conversation, ate a meal, discussed your life with PWD or has a person with a disability visited in your home or being annoyed or disturbed by the behavior of a person with a disability, pleasant or unpleasant experiences interacting with a person with a disability.

### Instrument validation

Four bilingual healthcare professionals translated the tool into Arabic and subsequently back-translated it into English, with two involved at each stage. Those professionals possessed expertise in clinical research and survey design. To ensure content validity, five professors who were experts in disabilities and healthcare reviewed the instrument. Each expert was asked independently, via email, to rate the relevance of each of the draft 33 items of the conceptual framework on a 4-point Likert scale (1 meaning "not relevant" to 4 meaning "highly relevant") and comment on the items. Following this, a pilot study with 40 participants was conducted to evaluate the clarity of the questions in the Arabic version. Data from the pilot study were excluded from the final analysis. Internal consistency was assessed using Cronbach's Alpha, which resulted in a satisfactory value ( $\alpha = 0.86$ ).

### Cross-sectional survey

The a cross-sectional design targeted university students (ages 17-25) in healthcare disciplines, including Physiotherapy, Occupational therapy, Medicine, Nursing, Dentistry, Hearing and Speech, Orthotics and Prosthetics, and Pharmacy.

Sample size was measured using the following equation:  $n = \frac{[DEFF * Np(1-p)]}{[(d2/Z21-\alpha/2 * (N-1)+p * (1-p))]}$  (25). A sample size of at least 255 students was deemed suitable for conducting the study, achieving a confidence level of 95% and standard error of 4% with an expected proportion of 50% for water pipe dependence. From a total of 255 invitations sent, 238 responses were received (response rate=93.3%), and 200 were included in the analysis. Although the target sample size was 255 participants, data from 200 complete responses were ultimately included in the analysis. Despite the reduced sample size, the adequacy for (EFA) was supported by a high Kaiser-Meyer-Olkin (KMO) value of 0.901 and a significant Bartlett's test ( $p < 0.001$ ). A post hoc power analysis using GPower confirmed that the sample provided adequate statistical power ( $\geq 0.85$ ) to detect

medium effect sizes ( $F^2 = 0.15$ ) with  $\alpha = 0.05$  in multivariate analyses.

As a result, students were chosen non-randomly by communicating with them between lectures and during breaks to obtain a representative sample of students from all academic disciplines, ages, and genders. All students were approached and invited to participate voluntarily, with the assurance that the information acquired would be kept confidential. Students who agreed to take part in the study signed informed consent. The data were collected using a paper-based, self-administered questionnaire, which was distributed and completed on-site.

### Statistical Analysis

Descriptive statistics were used to describe the participants. The content validity index (CVI) was computed to assess content validity at the item level (I-CVI) and the scale level (S-CVI). An S-CVI > 0.80 and an I-CVI 0.83 indicates satisfactory content validity (Waltz et al. 2005). The CVI was determined by summarizing the number of experts, giving each item a rating of 3 or 4, and dividing by the total number of experts.

Prior to conducting exploratory factor analysis (EFA), we assessed the suitability of the data using multiple diagnostics. Sampling adequacy was tested using the Kaiser-Meyer-Olkin (KMO) measure, and Bartlett's test of sphericity was used to evaluate whether correlations between items were sufficiently large for EFA. We also examined the anti-image correlation matrix to assess individual item suitability, communalities to check shared variance, and the determinant of the correlation matrix to ensure multicollinearity was not a concern. EFA using the principal components method of extraction was applied to the data to identify a factor structure and to estimate the number of factors and factor loadings. Items with a factor loading of less than 0.4 were subsequently removed from the instrument. The internal consistency of the subscales was estimated using Cronbach's alpha coefficient to establish the homogeneity of the subscale and the instrument's consistency. A high score implies a more positive attitude. Means and standard deviations (SD) were used to describe all the domains of the instrument. In the attitude part, response scales included "strongly agree and agree" (1 point awarded, indicating a positive attitude) or "strongly disagree" or "disagree" (0 points awarded, indicating a negative attitude). Responses for Contact with a person were calculated as "very often and often" (1 point awarded, indicating a positive attitude), "a few and once or twice," or "never" (no points awarded, indicating a negative attitude). The total attitude scores were calculated for each responder (range: 0-25), and the total scores for contact with a disabled person ranged from 0 to 8. They grouped into two levels, negative attitude and positive attitude, using a 60% cut-off point (26). Responses were recoded into binary categories ("positive" = 1 and "negative" = 0) for the purpose of descriptive prevalence reporting and group comparisons. This was done to simplify interpretation and align with prior studies using similar cut-off points to define attitude categories. However, we recognize that this binary transformation may reduce the granularity of responses. Therefore, the original ordinal data were used in the EFA and reliability testing to preserve the full range of response variability.

We examined associations between Attitudes towards Persons with Disabilities Inventory scores and sociodemographic variables using the chi-squared test, and independent t-tests were used whenever appropriate to assess associations. For variables with small subgroup sizes, such as disability status, Fisher's exact test was used instead of the chi-square test to ensure statistical validity. To estimate adjusted prevalence ratios (aPRs) for binary outcomes, we used Poisson

regression with robust error variance and a log-link function. This approach was selected as a suitable alternative to log-binomial regression, which may encounter convergence issues, and is commonly recommended for estimating prevalence ratios in cross-sectional studies. The findings were reported as an adjusted prevalence ratio (aPR) with a 95% confidence interval (CI). Statistical significance was defined as p-values less than 0.05. Quantitative statistical evaluation of data collected through questionnaires using the SPSS statistical software program, version 27.0.

## Results

### Background characteristics

A total of 200 respondents participated in the study. The mean age was 21.03 years, SD=2.01, range (18-24). The majority were female (57.5%), most from the allied health professions (49.5%) which includes Physiotherapy, Occupational therapy, Hearing and Speech, Orthotics and Prosthetics. Approximately 2% of students had disabilities, and 99% reported experience or contact with PWDs. See Table 1 for the respondents' students personal characteristics.

Table 2 displays the attitudes toward PWDs. The 24 statements that made up the thematic block of the questionnaire allowed respondents to rank their responses on a Likert-type scale. The participants' attitudes regarding the feelings and lives of PWDs were spread across the scale. More than half (59%) disagreed that they feel sorry about themselves and worry greatly (48%). Nonetheless, most of them agreed that PWDs are the same as anyone else (43%) (adding all the "strongly agreed" statements). The participants were also divided in terms of their comfort being around or dealing with PWDs. However, more than half (55.5%) would feel comfortable being around a person with intellectual disability. Any PWDs (58%), the participants would not feel (54.5%) comfortable living next door to a person with an intellectual disability who lives by himself.

Table 3 displays the total number and percentages of student responses toward contact with disabled persons. About a third dealt with PWD often and very often. However, about a third have frequently been visited by PWD in their home (32.5) or met with a person with a disability they like (47.5). The total contact score had a mean of 2.99 (SD = 0.48), indicating a moderate level of self-reported interaction with people with disabilities. The distribution of the contact scores was approximately normal, with a skewness statistic of 0.25, suggesting no major deviations from normality. These results reflect generally positive and consistent levels of social engagement across respondents, especially for common situations such as conversations and meals with people with disabilities.

After grouping the attitude into negative attitude and positive attitude, using a 60% cut-off point (26), 79.5% of healthcare students have a positive attitude toward disabled persons, while 20.5% of the respondents earned a total attitude score below 60% in the attitude section of Figure 1. When interacting with disabled individuals, 48.5% of healthcare students exhibit a negative attitude level of interaction, while 51.5% exhibit a positive attitude level of interaction.

**Table 1:** personal characteristics of the respondents

Variable	n	%
Age (mean $\pm$ SD)	mean $\pm$ SD=2.01	
Gender		

Male	85	42.5
Female	115	57.5
<b>Field of study</b>		
Nursing	28	14
Medicine	26	13
Dentistry	23	11.5
Pharmacy	24	12
Allied Health Professionals *	99	49.5
<b>Disability</b>		
No	196	98
Yes	4	2
Blind	1	.5
Hearing	1	.5
Impaired	2	1.0
<b>Contact with a disabled person.</b>	198	99.0
<b>Years of contact with a disabled person</b>	Mean	SD
Family person		
Relatives	10.22	1.71
Close friends	8.11	1.61
Classmates	8.50	3.33
Other	7.40	1.81
	7.76	2.13

<b>Contact with a disabled person Experience rating.</b>	Mean	SD
Family person	4.33	.50
Relatives	3.56	1.01
Close friends	4.25	0.46
Classmate	3.60	0.89
Other	3.99	0.07
* Physiotherapy, Occupational therapy, Hearing and Speech, Orthotics and Prosthetics		

#### Factor Analysis

The data met all assumptions for EFA. The KMO value was 0.91, indicating excellent sampling adequacy, and Bartlett's test of sphericity was significant ( $p < 0.001$ ), confirming the suitability of the data for factor analysis. The determinant of the correlation matrix was 0.001, suggesting no multicollinearity. All diagonal values in the anti-image matrix exceeded 0.5, and communalities were all above 0.4, indicating that all items contributed meaningfully to the factors.

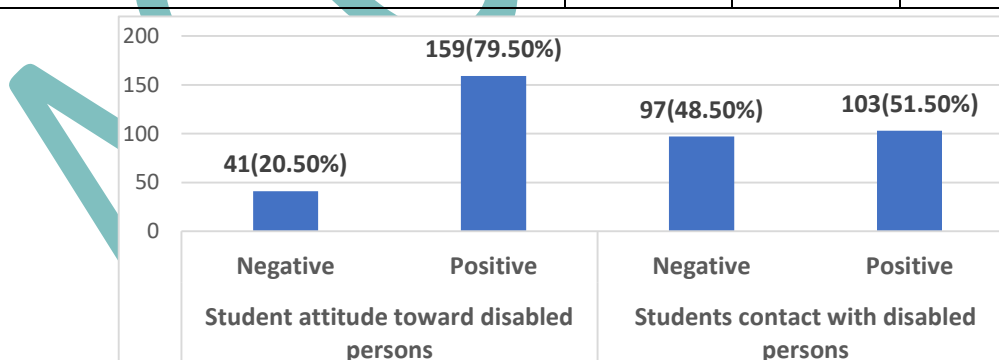
EFA using the principal components method of extraction was applied to the data to identify a factor structure and to estimate the number of factors and factor loadings. Items with a factor loading of less than 0.4 were subsequently removed from the instrument. The students generally had positive attitudes towards people with disabilities. The internal consistency of the identified subscales was also assessed. The Cronbach's alpha coefficient was 0.88 for the Attitude subscale and 0.82 for the Interaction subscale. The overall instrument demonstrated good internal consistency, with a total Cronbach's alpha of 0.86. These values indicate strong internal reliability for both the subdomains and the full scale.

**Table 2:** Number and percentage of attitude scores (n=200)

<b>Statement</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Agree</b>	<b>Strongly Agree</b>
Most people with disabilities feel sorry for themselves	66(33%)	52(26%)	46(23%)	36(18%)
Disabled people are the same as anyone else.	26(13%)	43(21.5%)	45(22.5%)	86(43%)
Most disabled people worry a great deal	53(26.5%)	43(21.5%)	47(23.5%)	57(28.5%)
Disabled people are as happy as nondisabled people	47(23.5%)	36(18%)	72(36%)	45(22.5%)
Most people with disabilities resent people without disabilities.	49(24.5%)	49(24.5%)	46(23%)	56(28%)
I am comfortable being around a person who has an intellectual disability	32(16%)	57(28.5%)	43(21.5%)	68(34%)
I would be comfortable being around a person with disabilities.	47(23.5%)	37(18.5%)	47(23.5%)	69(34.5%)
I would be comfortable working with a person with an intellectual disability when they have someone who is not disabled to help them.	54(27.0%)	47(23.5%)	52(26.0%)	47(23.5%)
I would feel comfortable living next door to a person with an intellectual disability who lives by himself.	59(29.5%)	50(25%)	52(26%)	39(19.5%)



I would be comfortable being around a person who uses a wheelchair.	39(19.5%)	55(27.5%)	52(26%)	54(27.0%)
Most people with disabilities expect special treatment	43(21.5%)	55(27.5%)	49(24.5%)	53(26.5%)
There should not be special schools for disabled people	56(28.0%)	47(23.5%)	44(22%)	53(26.5%)
I would be comfortable with disabled persons living and working in communities.	46(23.0%)	40(20.0%)	51(25.5%)	63(31.5%)
I would be comfortable performing a physical exam on the disabled person.	39(19.5%)	50(25.0%)	64(32.0%)	47(23.5%)
I would be comfortable establishing a differential diagnosis for the abdominal pain of a disabled person.	58(29.0%)	57(28.5%)	39(19.5%)	46(23.0%)
It is almost impossible for a disabled person to lead a normal life.	56(28.0%)	36(18.0%)	54(27.0%)	54(27.0%)
Disabled people tend to keep to themselves much of the time	50(25.0%)	50(25.0%)	40(20.0%)	60(30.0%)
Disabled people are more easily upset than non-disabled people	48(24.0%)	36(18.0%)	65(32.5%)	51(25.5%)
Disabled people are often grouchy.	45(22.5%)	50(25.0%)	65(32.5%)	40(20.0%)
Parents of disabled children should be less strict than other parents	58(29.0%)	50(25.0%)	35(17.5%)	57(28.5%)
Physically disabled persons are just as intelligent as non-disabled ones.	51(25.5%)	40(20.0%)	52(26.0%)	57(28.5%)
Disabled people are usually easier to get along with than other people.	48(24.0%)	60(30.0%)	46(23.0%)	46(23.0%)
People with disabilities should be cared for in any primary care office as opposed to a specialty clinic.	46(23.0%)	56(28.0%)	39(19.5%)	59(29.5%)
You should not expect too much from disabled people.	43(21.5%)	47(23.5%)	44(22.0%)	66(33.0%)
You have to be careful what you say when you are with disabled people	50(25.0%)	43(21.5%)	49(24.5%)	58(29.0%)



**Figure 1:** Students Attitude and contact with PWDs

EFA using the principal components method of extraction was applied to the data to identify a factor structure and to estimate the number of factors and factor loadings. Initially, the Kaiser criterion (eigenvalues >1.0) suggested a three-factor solution. However, recognizing that relying solely on this criterion can overestimate the number of factors, we complemented our approach with a scree plot and a parallel analysis using Monte Carlo simulations. The scree plot showed a clear inflection point after the second factor, and the parallel analysis revealed that only two components had

eigenvalues greater than those from random data. These findings support a more parsimonious and theoretically coherent two-factor solution, which was ultimately retained. In EFA, the correlations among items generally exceeded 0.32. The Kaiser-Meyer-Olkin test of sampling adequacy represents a high value of 0.901, exceeding the suggested minimum of 0.6. Bartlett's test of sphericity was significant ( $P < 0.001$ ), indicating that these data were appropriate for factor analysis.

The correlations among components were 0.491–0.891, suggesting that using oblique rather than orthogonal rotation was appropriate. According to Tabachnick and Fidell (2013), when factor

intercorrelations exceed 0.32, an oblique rotation is recommended because it allows for a more realistic representation of potentially correlated constructs. Therefore, Direct Oblimin rotation was chosen to account for the conceptual overlap between dimensions of attitudes toward persons with disabilities (27).

Several items showed substantial loadings (>0.6) on more than one factor. These cross-loadings reflect the inherent conceptual overlap between the attitudinal and interactional dimensions of the instrument. Although a strict simple structure was not fully achieved, we retained these items based on their theoretical relevance, contribution to internal consistency, and clarity of interpretation within the overall factor model. This is consistent with psychometric literature suggesting that modest cross-loadings are acceptable when factors are expected to correlate and when conceptual clarity is maintained (28). The final two-factor solution accounted for 48.3% of the total variance, with Factor 1 (Attitudinal Dimension) having an eigenvalue of 9.12 and Factor 2 (Interactional Dimension) an eigenvalue of 6.73. The cumulative variance explained by the two factors was 48.3%, meeting the acceptable threshold for construct validity in social science research (see Table 4).

**Table 4:** Pattern Matrix of the study instrument

Item	statement	Factor 1	Factor 2
2	Most people with disabilities feel sorry for themselves	0.891	0.652
3	Disabled people are the same as anyone else.	0.882	0.842
1	Most disabled people worry a great deal	0.810	0.692
4	Disabled people are as happy as nondisabled people	0.795	0.652
5	Most people with disabilities resent people without disabilities.	0.752	0.610
6	I am comfortable being around a person who has an intellectual disability	0.742	0.783
7	I would be comfortable being around a person with disabilities.	0.692	0.562
8	I would be comfortable working with a person with an intellectual disability when they have someone who is not disabled to help them.	0.658	0.623

9	I would feel comfortable living next door to a person with an intellectual disability who lives by himself.	0.612	0.820
10	I would be comfortable being around a person who uses a wheelchair.	0.583	0.820
11	Most people with disabilities expect special treatment	0.562	0.789
12	There should not be special schools for disabled people	0.523	0.665
13	I would be comfortable with disabled persons living and working in communities.	0.820	0.782
14	I would be comfortable performing a physical exam on the disabled person.	0.820	0.775
15	I would be comfortable establishing a differential diagnosis for the abdominal pain of a disabled person.	0.789	0.693
16	It is almost impossible for a disabled person to lead a normal life.	0.765	0.652
17	Disabled people tend to keep to themselves much of the time	0.756	0.612
18	Disabled people are more easily upset than non-disabled people	0.732	0.548
19	Disabled people are often grouchy.	0.700	0.593
20	Parents of disabled children should be less strict than other parents	0.621	0.491
21	Physically disabled persons are just as	0.591	0.583

	intelligent as non-disabled ones.		
22	Disabled people are usually easier to get along with than other people.	0.52	0.580
23	People with disabilities should be cared for in any primary care office as opposed to a specialty clinic.	0.491	0.723
24	You should not expect too much from disabled people.	0.692	0.810
25	You have to be careful what you say when you are with disabled people	0.658	0.825
26	Have you had a conversation with a person with a disability.	0.612	0.786
27	Have you eaten a meal with a person with a disability.	0.583	0.668
28	Have you discussed your life or problems with a person with a disability.	0.562	0.789
29	Has a person with a disability visited your home.	0.522	0.772
30	Have you met a person with a disability that you like.	0.821	0.690
31	Have you been annoyed or disturbed by the behavior of a person with a disability.	0.821	0.552
32	Have you had pleasant experiences interacting with a person with a disability.	0.789	0.712
33	Have you had unpleasant experiences interacting with a	0.762	0.648

	person with a disability.		
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*Eigenvalues: Factor 1 = 9.12; Factor 2 = 6.73. Total variance explained: 48.3%*

The chi-square test assessed the statistical significance of the difference in attitude categories based on respondent characteristics and other variables. Table 5 shows significant relationships between healthcare students' attitudes towards PWD and being disabled ( $P\text{-value} = 0.006 < 0.05$ ). Moreover, Table 5 shows the multivariate logistic regression of the factors contributing to the attitude. Female participants were nearly 1.09 times more likely to have positive attitudes than male health students ( $OR = 1.09$ ,  $CI: 0.53\text{-}2.25$ ,  $p = 0.819$ ). For the field of study, nursing ( $OR = 1.19$ ,  $CI: 0.39\text{-}3.62$ ,  $p = 0.76$ ), medicine ( $OR = 1.12$ ,  $CI: 0.28\text{-}4.48$ ,  $p = 0.87$ ), Dentistry ( $OR = 2.5$ ,  $CI: 0.47\text{-}13.22$ ,  $p = 0.27$ ), and Pharmacy ( $OR = 0.83$ ,  $CI: 0.23\text{-}3.09$ ,  $p = 0.78$ ). Finally, the contact with disabled persons ( $OR = 1.32$ ,  $CI: 0.64\text{-}2.73$ ,  $p = 0.44$ ).

## Discussion

Healthcare students often have a variety of perspectives on working with people with disabilities. Some may approach the prospect with eagerness, viewing it as an opportunity to make a meaningful impact on someone's life. Others may feel apprehensive and unsure of how best to provide care or support to individuals with unique needs (29,30). It is essential to recognize that each student brings their background, experiences, and biases to their interactions with individuals with disabilities. Most of our students had a positive attitude towards PWDs and reported moderate contact with them. There was no difference in the attitude between different fields of healthcare studies, sex, and contact with PWDs. Having a disability will improve the attitude toward other PWDs, but the low representativeness in the sample obscures the expected high significance.

Healthcare students' views towards people with disabilities substantially impact the quality of care offered. Creating and validating trustworthy methods to test these attitudes is critical for designing effective educational interventions. Factor analysis is crucial in this procedure since it ensures that the measuring tools are reliable and valid.

Arabi et al. used EFA to create a tool for testing attitudes toward people with impairments among medical students. He focuses on assessing the influence of a disability module on medical students' attitudes toward people with impairments (31). Myong et al. used factor analysis in their study, which focused on creating and validating a novel tool to measure individuals' attitudes and perspectives toward PWDs (16). Our study added to these as it created a reliable and valid scale to assess attitudes towards PWDs in healthcare students. This is crucial for understanding and addressing attitudinal barriers that hinder social inclusion and equality for PWDs.

Healthcare providers frequently make assumptions about PWDs' low quality of life, even though PWDs may not always express their concerns (32). The same was found among our participants. Additionally, individuals with disabilities frequently perceive that their healthcare providers are insensitive and prioritize their impairment over the patient's condition or the reason for the visit (33). The responses were clear: The participants were divided equally on whether they were comfortable dealing with or examining PWD, as it may not be clear what agenda the patient came with. Disabled individuals also frequently mention that they are required to educate healthcare professionals, employees, and students about the fundamentals of disability (34). Similarly, Sharby and colleagues (2015) discovered that health professionals and

healthcare students are frequently uncertain about how to engage with PWDs. Furthermore, physicians frequently assume that the obstacles to healthcare that PWDs encounter are exclusively associated with access, neglecting to account for knowledge—or

attitude-related barriers, such as implicit prejudice against PWDs or a lack of understanding/awareness of disability among healthcare providers (35).

**Table 5:** Healthcare Students' attitudes Towards Disability Grouped by sociodemographic variables

Variables	Attitude		P-value	Multivariate analysis	
	negative	positive		aOR (95%CI)	aP-value
<b>Gender</b>					
Male*	16(18.8%)	69 (81.2%)		1	
Female	25 (21%)	90(78.3%)	.614	1.09 (0.53-2.25)	.819
<b>Do you have a disability?</b>					
Yes*	3(75%)	1(25%)		1	
No	38(19.4%)	158(80.6%)	.006†	0.06(0.006-0.67)	0.064
<b>Field of study</b>					
Allied Health Professionals*	20(20.2%)	79(79.8%)		1	
Nursing	7(25%)	21(75%)	0.87	1.19(0.39-3.62)	0.76
Medicine	6(23.1%)	20(76.9%)		1.12(0.28-4.48)	0.87
Dentistry	3(13%)	20(87%)		2.5(0.47-13.22)	0.27
Pharmacy	5(20.8%)	19(79.2%)		0.83(0.23-3.09)	0.78
<b>Have you ever had experience or contact with people with disabilities?</b>					
Yes*	41(20.7%)	157(79.3%)	0.47	1	
No	0(0%)	2(100%)		0	1
<b>Do you contact with disabled persons?</b>					
Low*	19(19.6%)	78(80.4%)	0.77	1	
high	22(21.4%)	81(78.6%)		1.32(0.64-2.73)	0.44

\*Reference group, † Fisher's exact test

Proposed by Gordon Allport in 1954, Contact Theory suggests that under appropriate conditions, interpersonal contact is one of the most effective ways to reduce prejudice between majority and minority group members (36). Our results at the univariate level showed this; the insignificance in the multivariate doesn't preclude this association. A meta-analysis by Pettigrew and Tropp (2006) reviewed over 500 studies and found that intergroup contact reduces prejudice, including prejudice against PWDs (37). Inclusive education, in which students with disabilities learn alongside their peers, often leads to improved attitudes among non-disabled students (38). Studies in organizational settings have found that employees who work with colleagues with disabilities report more positive attitudes toward them, primarily when the work environment promotes collaboration and equal status (39).

This study has the following limitations. Firstly, the study employed non-random convenience sampling, which may introduce selection bias and limits the generalizability of our results to the wider population of healthcare students. This method was chosen due to practical constraints such as

accessibility and time limitations. Despite this, we ensured diversity in the sample by including students from various healthcare disciplines, academic levels, and genders. Moreover, such sampling is commonly accepted in psychometric validation studies where the primary aim is instrument development rather than population inference. Secondly, self-reporting bias may cause inaccurate finding due to the desire to create a positive impression. The next step is to test the instrument on a larger non-random sample. Finally, the cross-sectional survey design restricts our capacity to establish causal relationships, and the attitudes may evolve. However, our study was one of the first to address and assess these issues in healthcare students. Finally, although the regression model provided adjusted prevalence estimates, several predictors—particularly subgroup variables such as field of study—yielded wide confidence intervals and non-significant associations. This may be due to limited sample sizes within subgroups, reducing statistical power and increasing the risk of Type II error. As a result, some true associations may not have been detected, and these findings should be interpreted with caution.



## Conclusion

This study emphasizes the necessity of enhancing the attitudes of healthcare students toward PWDs. This is particularly crucial in light of the current conflict in Gaza and the resulting increase in the number of PWDs. To achieve this, comprehensive educational interventions are necessary. The Arabic-language instrument developed in this study demonstrated strong psychometric properties, with excellent internal consistency (Cronbach's alpha = 0.86) and construct validity confirmed through EFA. These findings support the reliability and validity of the scale as a practical tool for assessing healthcare students' attitudes and interaction with people with disabilities. While students demonstrated generally positive attitudes, there remains a critical need for enhanced training on disability inclusion within the healthcare curriculum. The Palestinian government has enacted policies aimed at ensuring non-discrimination and equal access to healthcare for PWDs, yet enforcement, particularly in regions like Gaza, is inconsistent. Accessibility challenges, such as the lack of infrastructure in public institutions, exacerbate PWDs' difficulties in accessing necessary care. Furthermore, while the Palestinian Ministry of Health, in collaboration with international organizations, provides disability-related training for healthcare professionals, the inclusion of disability rights and comprehensive disability care in the healthcare curriculum remains inadequate. Addressing these curriculum gaps by integrating more inclusive and hands-on training would better equip healthcare providers to meet the needs of PWDs, ultimately fostering a more equitable healthcare system.

## Disclosure Statements

### Ethics approval and consent to participate

All procedures performed in this study followed the Declaration of Helsinki. The Institutional Review Board approved the study [Ref #: ER.CM Jan 1\2024].

All subjects involved in the study were invited to participate voluntarily, and informed consent was obtained from all participants.

### Consent for publication

Not applicable

### Availability of data and materials

The data supporting this study's findings are available from the corresponding author upon reasonable request

### Author's contribution

The authors confirm contribution to the paper as follows: study conception and design: Nawajah I., theoretical calculations and modeling: Nawajah I., data analysis and validation: Nawajah I., draft manuscript preparation: Maraqa, B. All authors reviewed the results and approved the final version of the manuscript.

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## Conflicts of interest

The authors have no competing interests to declare relevant to this article's content.

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