

# Factors Associated with Public Attitudes Towards Persons with Disabilities: A Systematic Review

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## Research Article

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# Abstract

**Objective** The aim of this review is to identify and summarize factors that are associated with public attitudes towards people with various disabilities systematically.

**Methods:** An electronic search of three databases was performed (Medline, EMBASE and Cochrane) covering the period from 1950 to present. A comprehensive search strategy was developed and citation lists for potential eligible studies were also screened. Only quantitative studies using valid measurements were included, and the methodological quality of included studies was appraised based on three criteria (sample, measurement, analysis) by two independent reviewers.

**Results:** Twenty-seven studies met the eligibility criteria and were included in the study. Three categories of the factors were found to be associated with the public attitudes, which are related to the attitude provider, disabled people, and society respectively. Specifically, the more people know about disabilities, the more positive their attitude could be; and the frequency and quality of the contact with the disabled are also proved to be influential to the attitudes. Meanwhile, the type of disability is also closely correlated to the public's attitude towards the disabilities.

**Conclusion:** People's knowledge of the disability and their contact with the disabled are the main factors that influence public attitude towards persons with disabilities.

## Key Messages

- This study provides a comprehensive overview of attitudes toward the general disabled, rather than focusing on a specific angle (e.g., specified type of disability or specific domain of the attitude), to fill in the current knowledge gap.
- There are three categories of factors that found to be associated with the public attitudes, which are related to the attitude provider, disabled people, and society respectively.
- People's knowledge of the disability, and the quality and frequency of their contact with the disabled are the main factors that influence public attitude towards persons with various disabilities.

## 1. Background

Disability has become a natural part of the global human condition across various areas, due to the growing aging population, and the changes of demographics of societies<sup>[1]</sup>. According to the World Health Organization<sup>[2]</sup>, there are more than one billion people (15% of the world's population) experiencing disability, which also poses a serious medical and social burden in the world<sup>[3]</sup>. Therefore, it evokes the public to consider how to best include and support people with disabilities. Recent years, many countries have started to develop social and rehabilitation plans for people with mental and physical disabilities in their community<sup>[4]</sup>, in order to overcome the burden and promote their well-being.

Nothing is more essential to the well-being of people with disabilities than acceptance and support given by the public<sup>[5]</sup>. As by Helen Keller, a famous disabled writer, “the chief handicap of the blind is not blindness, but the attitude of seeing people towards them”. Attitudes toward the disability involve multidimensional evaluation of people, and can be either positive or negative, or comprised of both<sup>[6]</sup>. A number of studies have reported the impacts of different attitudes, for example, positive social attitudes could facilitate inclusion and facilitate acceptance by family, friends, and employers<sup>[7]</sup>, while negative attitudes may lead to low expectations, discrimination, and marginalization<sup>[8]</sup>. To be more specific, evidence showed that negative attitudes of the healthcare professionals have been indicated as a barrier for the disabled’s participation in several demands such as physical activity, fitness, and education settings<sup>[9]</sup>. Given on this global situation and the importance of attitude, it is important to urge the public to rethink and promote their attitudes towards people with disabilities, in order to build a more inclusive society.

Evidence shows that social inclusion, community participation and the empowerment of people with disabilities, are central concepts guiding current policies and services around the world<sup>[10]</sup>. Public attitudes towards disabled people not only affect their integration into the community and public services<sup>[11, 12]</sup> but also influence their daily lives and social participation<sup>[7, 11]</sup>, such as employment<sup>[13]</sup>. As recognized by several studies<sup>[14, 15]</sup>, attitudes can be formed by people’s past and present experience, indicating that a variety of factors could mediate and impact public attitudes toward disabled people. The concept of attitude is multidimensional<sup>[16, 17]</sup>, and there no current studies available regarding public attitudes towards people with various disabilities. It is therefore necessary to identify the influential factors and understand if the association between those factors and the public attitudes exists. This could provide insights on finding appropriate measures to not only promote the positive attitudes<sup>[15]</sup>, but also modify the negative attitudes<sup>[4]</sup>. An overview of potential influential factors, both hindering and facilitating, could provide information for health professionals, educators, and policy maker for developing effective interventions and decisions.

Therefore, this study aims to systematically collect, identify, and evaluate factors that associated with public attitudes towards people with disabilities, so as to provide a basis for the further study targeting this area.

## **2. Methods**

### **2.1 Search strategy and eligibility criteria**

In March 2020, we searched the following electronic databases, starting from their dates if inception: Medline (Ovid), EMBASE and Cochrane. Articles from 1950 to present were searched. A comprehensive search strategy was developed with three major themes- (a) attitude, (b) factor and (c) disability with individual search terms for each database, such as: ["Attitud\*" OR "belief" OR "ageis\*" OR "agis\*" OR "discriminat\*" OR "prejudic\*" OR "stereotyp\*" OR "stigma"] AND ["physically challenged OR handicap\* OR

disabled OR disabilities OR disability OR impairment OR disorder]. In addition, we screened the citation lists of included and relevant papers for potential eligible studies. Studies retrieved from the initial searches were screened using the following inclusion criteria: (1) study aim is to understand influencing factors associated with public attitudes, (2) study outcome is the attitude toward people with disabilities, and (3) study design is cross-sectional or cohort. Exclusion criteria were: (1) qualitative design, (2) study evaluating an intervention, and (3) report language is non-English.

Endnote was used to list all literatures retrieved in the database and check for duplicates. Two researchers independently screened the titles and abstracts of the remaining non-duplicates to exclude the irrelevant literatures. In case of the divergence, the third senior researcher evaluated the duplicates and the uncertainties. After removing the unrelated literatures second time, two researchers read the full text respectively, the remaining records were applied according to the inclusion and exclusion criteria.

## **2.2 Quality assessment and data synthesis**

Only quantitative studies using valid measurements were included in this review, and correlation analyses or difference testing results were appraised for each study. The methodological quality of the included 27 studies was rated by evaluating three key criteria based on the McMaster Critical Review Form for quantitative research. The criterion 'sample' examined whether or not selection bias was reduced, the sample size was appropriate for the study design and research objective, and the characteristics of the participants were fully described. The criterion 'measurement' examined whether or not measurement bias was controlled for the: subject, observer, procedure, and instrument. The criterion 'analyses' examined whether or not the analyses tests were matched to the research question, the outcome measurement scale, and the nature (e.g., category and numbers) of the outcome and exposure variables. Each criterion was scored with one star (no evidence meeting the requirement), or two stars (report but unclear, some evidence but not enough), or three stars (has evidence meeting the requirement). Two reviewers independently performed the methodological quality assessment. Any discrepancies between the two reviewers were discussed until consensus was reached. If consensus could not be reached, agreement was obtained through discussion with a third reviewer. We did not conduct any meta-analysis given the heterogeneity of the reporting instruments employed.

After systematical collection and evaluation, synthesis of original literature could: describe the extent to which current factors influence public's attitudes toward the disabled, identify the existing problems and gaps, and provide implications for improving the attitudes toward the disabled. The included studies were independently reviewed and summarized by two reviewers. Any discrepancies were resolved through discussion. Descriptive data from all studies, including literature authors, publication dates, subjects, types of disability, tools and results, were extracted using a uniform table. The findings were then categorized to summarize the state of the studies for different associated variables.

## **3. Results**

Initial screening of the 1286 search results from the main search removed 291 duplicates, and the remaining 995 records were screened. 926 articles did not address the general topic in title or abstract, and the remaining 69 articles were scanned full text for eligibility. Following this, 42 articles were removed because they did not measure attitudes using validated instruments, did not address public attitudes towards disabled people, or did not use direct measurements. After the initial electronic search and the manual search of the reference according to the inclusion and exclusion criteria, a total of 27 studies met the eligibility criteria for the final review. A flow diagram of literature search and selection process was shown in Fig. 1. The risk of bias of this study is low and we tried to avoid the selection bias by critically appraising each included one, while publication bias may exist since statistically significant studies are more likely to be published.

Table 4 provides the methodological quality rating results for the included studies. Only one study<sup>[40]</sup> scored the maximum rating of three stars for all three criteria, while none of the included studies scored the rating of one star for any criteria. Seven studies reported the evidence that meets the measurement criteria, but the others haven't justified clearly enough about the bias control, or the psychometric properties of the instrument. Eleven studies<sup>[14, 21, 20, 25, 26, 27, 35, 40, 42, 37, 38]</sup> scored three stars for "analysis", which means they chose the appropriate analysis strategy for the given outcome measuring scale and have provided enough evidence, whereas the others rated two stars. The participants of most included studies were in a younger age range (e.g., students), which may cause a selection bias.

The included studies revealed that a variety of factors were associated with public attitudes towards persons with disabilities. These factors were divided into three categories, namely, factors related to the provider, factors related to the disabled, and factors related to the society.

### **3.1 Factors related to the attitude holder**

Relationships between variables related to the provider and their attitudes toward people with disabilities across 25 studies are demonstrated in Table 1.

Table 1  
Variables related to provider

Factors	Ref.	Instruments	Study population and setting	Results
Gender	[10]	ATTID	Participants: 1605adults  Setting: Québec, Canada	While men have more negative attitudes regarding discomfort, women have more negative attitudes to the knowledge about competence and rights
	[21]	CLAS-MR (Form A & B)	Participants: 452 adults  Setting: Karachi, Pakistan	Females hold more positive attitudes toward individuals with intellectual disability
	[22]	TATDP	Participants: University students (582 from Medical School, 224 from School of Nursing)  Setting: Ege University, Turkey	Females have better attitude towards the disabled people than males
	[18]	CATCHs; MAS	Participants: 200 high school and 144 university students  Setting: Nijmegen, Netherlands	Girls have more positive attitude towards the disabled
	[20]	ATDP (Form B)	Participants: 297 medical and dental students and healthcare professionals  Setting: San Francisco, United States	Compared with men, women have more positive attitude towards people with physical disabilities

ATDP, The Attitudes toward Disabled People; CATCHs, The Chedoke-McMaster Attitudes Toward Children with Handicaps; ATTID, The Attitudes Toward Intellectual Disability; MAS, Multidimensional Attitudes Scale toward Persons with Disabilities; ADS, The Attitudes to Disability Scale; CLAS-MR. the Community Living Attitudes Scale—Mental Retardation Form; CAMI, The Community Attitudes Towards Mental Illness Scale; MRAI-R, The Mental Retardation Attitude Inventory-Revised; GNAT, A Go/No-go Association Task; DSDS, The Disability Social Distance Scale; SADP, Scale of Attitudes towards Disabled Persons; IM4Q, Independent Monitoring for Quality; ID, Intellectual Disabilities; ADA, The Americans with Disabilities Act; TATDP-Turkish Attitudes towards Disabled Person Scale; IDD, Intellectual and Developmental Disability

Factors	Ref.	Instruments	Study population and setting	Results
	[23]	ATDP (Form B)	Participants: 634 college students, and 234 healthcare professionals  Setting: Tel Aviv University, Israel	Gender is not related to attitudes among students
	[19]	A specially designed attitude questionnaire	Participants: 129 individuals  Setting: Pennsylvania, United state	Women have more positive attitude towards the disabled than men
	[24]	ATDP (Form A)	Participants: 197 clinical physiotherapy students  Setting: Three Universities in Nigeria	Gender has no influence on attitude
Age	[10]	ATTID	Participants:1605 participants  Setting: Québec, Canada	More positive attitudes are revealed among younger participants.
	[14]	ADS	Participants: 2912 people with disability, 507 caregivers, and 354 members of the public  Setting: Guangzhou, China	Older people have more negative effects on attitude towards disability
	[21]	CLAS-MR (Form A & B)	Participants: 452 Pakistani nationals  Setting: Karachi, Pakistan	Younger individuals have more negative attitudes towards the disabled

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Factors	Ref.	Instruments	Study population and setting	Results
	[18]	CATCHs; MAS	Participants: 200 high school and 144 university students  Setting: Nijmegen, Netherlands	The older the respondents, the more positive their attitudes towards the disabled
	[20]	ATDP (Form B)	Participants: 297 medical and dental students, and healthcare professionals  Setting: San Francisco, United state	Age was not significantly correlated with ATDP scores, and would have no effect on attitudes.
	[19]	A specially designed attitude questionnaire	Participants: 129 individuals  Setting: Pennsylvania, United States	Younger adults generally voice more favorable attitudes than older adults
	[24]	ATDP (Form A)	Participants: 197 clinical physiotherapy students  Setting: Three universities in Nigeria	Older students have better attitudes towards the disabled
	[25]	MRAI-R	Participants:135 participants  Setting: Taiwan, China	Old people tend to have more positive attitude to the disabled
	[26]	ATDP (Form O)	Participants: 587 undergraduate nursing students  Setting: Three cities in Turkey	People between 18 and 21 years old are more positive towards the disabled than people aged 22 and over

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Factors	Ref.	Instruments	Study population and setting	Results
	[27]	ATDP (Form A);SADP;CLAS-MR	Participants: 78 nursing students and 43 non-nursing peers  Setting: Netherlands	Older age is a marginally statistically significant predictor of a more positive attitude to physically disabled persons by the ATDP-A, but not the SADP
	[28]	ATDP (Form O)	Participants: 67 baccalaureate nursing students  Setting: University in the Midwest, United States	Age fails to contribute significantly to the change in nursing students' attitudes
Education	[10]	ATTID	Participants: 1605 adults  Setting: Québec, Canada	More positive attitudes are revealed among better educated participants
	[21]	CLAS-MR (Form A &B)	Participants: 452 Pakistani nationals  Setting: Karachi, Pakistan	Well-educated Pakistanis are more positive about people with intellectual disabilities
	[28]	ATDP (Form O)	Participants: 67 baccalaureate nursing students  Setting: United States	Junior and senior students show more positive attitudes than sophomore students towards the disabled
	[26]	ATDP (Form A)	Participants:197 clinical physiotherapy students  Setting: Three Universities in Nigeria	Students of the University of Maiduguri had more positive attitude compared to students of the University of Ibadan and Nnamdi Azikiwe University
Contact	[10]	ATTID	Participants: 1605 adults  Setting: Québec, Canada	The more frequent the contact, the more positive the attitudes

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Factors	Ref.	Instruments	Study population and setting	Results
	[14]	ADS	Participants:2912 people with disability, 507 caregivers, and 354 members of the public  setting: Guangzhou, China	The longer caregivers cared for disabled people, the more negative attitudes towards the disabled people
	[22]	TATDP	Participants: University students (582 from Medical School, 224 from School of Nursing)  Setting: Ege University, Turkey	Those who were previously in close contact with disabled people have significantly better attitude than those who were not.
	[20]	ATDP (Form B)	Number: 297 medical and dental students and healthcare professionals  Setting: San Francisco, United State	The frequent contact individuals have better attitude towards the disabled
	[25]	MRAI-R	Participants:135 healthy participants  Setting: Taiwan, China	The longer they worked with colleagues with disabilities, the more positive their mood was
	[26]	ATDP (Form O)	Participants: 587 undergraduate nursing students  Setting: Three cities in Turkey	Whether students had experience of contacting with disabled in clinical practice, there was no statistically significant difference in students' attitude
	[32]	SADP	Participants:338 Chinese students in three secondary schools  Setting: Hong Kong, China	Students who had the least contact with the disabled are more optimistic and concerned about the human rights situation of the disabled and have fewer misunderstandings about the disabled.

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Factors	Ref.	Instruments	Study population and setting	Results
	[31]	the Interaction with Disabled Persons scale; the Community Living Attitudes scale; and the Barriers to Exercise scale	Participants: 16 students and 16 young adults with Down syndrome Setting: Australia	Contact with young adults with disabilities can lead to positive changes in students' attitudes towards disability
	[33]	GNAT	Participants:550adults Setting: United States	Higher quality of contact predicted stronger positive implicit attitudes toward intellectual and developmental disability; however quantity of contact was related to higher levels of explicit prejudice.
	[39]	The Disability Questionnaire	Participants:142 employers Setting: Colorado Springs, United States	Having a high level of experience working with disabled employees can generate positive employer attitudes
	[41]	Students' Attitudes toward People with a Disability Scale	Participants:406 students at a mainstream secondary school Setting: Hong Kong	Students having social contact and participating educational programs have a higher positive change in their attitudes.
Familiarity	[18]	CATCHs; MAS	Participants: 200 high school and 144 university students Setting: Nijmegen, Netherlands	Being familiarity with a disabled person has a significant positive effect on attitudes
	[21]	CLAS-MR(Form A & B)	Participants:452 Pakistani nationals Setting: Karachi, Pakistan	Participants who reported having a friend or relative with a disability have significantly different attitudes than individuals without a friend or relative with a disability

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Factors	Ref.	Instruments	Study population and setting	Results
	[27]	ATDP (Form A)	Participants: 78 nursing students and 43 non-nursing peers  Setting: Netherlands	An important additional predictor of a more positive attitude about physically disabled people was having a relative or friend with a physical disability, but this association was not apparent in attitudes towards intellectually disabled persons
	[28]	ATDP (Form O)	Participants: 67 baccalaureate nursing students  Setting: United States	There were no significant differences in attitudes toward people with disabilities based on having a family member or friend with a disability or being in frequent personal contact with a disabled individual.
	[34]	DSDS	Participants: 402 entry-level occupational therapists  Setting: United States	Respondents who exhibited a greater amount of nonclinical contact with persons with disabilities would exhibit more positive attitudes toward these persons
	[35]	The Interaction with Disabled Persons' Scale	Participants: 2299 students from 37 physiotherapy and 24 occupational therapy schools  Setting: United Kingdom	Students who have found a family member with a disability or who has an informal social connection with a person with a disability are more positive than those who do not.
	[36]	ATDP (Form O)	Participant: 166 college students  Setting: United States	Previous working experiences with people with disabilities have a greater positive attitude than those who do not work with people with disabilities,

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Factors	Ref.	Instruments	Study population and setting	Results
	[37]	CATCH	Participant: 357 elementary school male students (grades 3–6)  Setting: Riyadh city, Saudi Arabia	Participants from schools that included students with intellectual disabilities had more positive attitudes towards peers with disabilities than those in schools that did not include such students. But having a relative with a disability did not have a significant influence
Knowledge	[22]	TATDP	Participants: University students (582 from Medical School, 224 from School of Nursing)  Setting: Ege University, Turkey	People who have knowledge about the attitudes towards the disabled in advance will have a better attitude.
	[26]	ATDP-form O	Participants: 587 undergraduate nursing students  Setting: Three cities in Turkey	Prior knowledge has a positive impact on creativity, consciousness and development attitude
	[38]	CAMI	Participants: 62 primary care nurses  Setting: three major healthcare centers in Brunei	Increase in knowledge level decreases social restrictiveness(negative) attitude
	[39]	The disability questionnaire	Participants:142 employers  Setting: Colorado Springs, United States	Employer attitudes was not related to their knowledge about what constitutes ADA (Americans with Disabilities Act )
Profession	[23]	ATDP (Form B)	Participants: 634 college students and 234 healthcare professionals  Setting: Tel Aviv University, Israel	X-ray technicians have lesser positive attitudes toward the person with disability than occupational therapists, nurses, family doctors and physical therapists.

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Factors	Ref.	Instruments	Study population and setting	Results
	[29]	The Teacher Integration Attitudes Questionnaire	Participants: Teachers of physical education (56) and music education (54)  Setting: University of Kansas, United States	Music education teachers held significantly less favorable attitudes towards children with emotional and behavioral disorders; Physical education teachers held significantly less favorable attitudes about socialization of children with orthopedic handicaps
Religion	[18]	CATCHs; MAS	Participants: 200 high school and 144 university students  Setting: Nijmegen, Netherlands	Religion does not influence the attitude on the disabled
	[30]	A picture-ranking interview of specific physical disabilities	Participants: 54 children with craniofacial anomalies and 68 healthy children  Setting: Negros, Philippines	Religions' beliefs are very significant for comprehending attitudes toward disabled groups
	[23]	ATDP (Form B)	Participants: 634 college students and 234 healthcare professionals  Setting: Tel Aviv University, Israel	Religion does not influence the attitude on the disabled
Income	[10]10]	ATTID	Participants: 1605 adults  Setting: Québec, Canada	Attitudes are generally not associated with income

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Factors	Ref.	Instruments	Study population and setting	Results
Self-esteem	[18]	CATCHs; MAS	Participants:200 high school and 144 university students  Setting: Nijmegen, Netherlands	For behavior and positive affect index, the higher the participants' self-esteem, the more positive attitude was toward deaf and blind peers, but not toward paralyzed and intellectually disabled peers; for cognition and negative affect index, self-esteem affects attitudes toward all the disabled, except the paralyzed peers.
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### 3.1.1 Demographic factors

The most commonly investigated demographic factors that associated to the attitude provider are gender, age, and education, while the impacts of other related factors such as income and religion were estimated in very few studies.

#### a) Gender.

A total of eight studies examined gender as an influential factor [10, 18–24]. Among them, significant differences were found in attitude between men and women in six studies [10, 18–22], while two other studies reported that there is no relationship between gender and attitudes toward people with disabilities [23, 24]. Particularly, within these six studies, five studies found that males view persons with disabilities more negatively than females [18–22]. However, Morin et al [10] indicated that man could have more negative attitudes than women regarding the discomfort index, whereas women had more negative attitudes regarding the knowledge of capacity and rights index than men. This may also demonstrate that scores of female tend to be more positive on behavior rather than cognition.

#### b) Age

A total of eleven studies [10, 14, 18–21, 24–28] examined the association between age and public attitudes with nine of them [10, 14, 18, 19, 21, 24–27] reporting significant differences between younger and older people in the score of the attitudes. Nevertheless, disparity exists in these studies, among which four studies [18, 24,

<sup>25, 27]</sup>found that older people hold more positive attitudes than younger people toward the disabled, whereas the five others<sup>[10, 14, 19, 21, 26]</sup> reported the opposite results.

## **c) Education**

While two studies<sup>[20, 24]</sup> suggested no evidence of an association between education level and their attitudes, three others<sup>[10, 21, 28]</sup>found that lower education level appeared to be associated with negative attitude towards disabled people.

## **d) Job and income factors**

Two studies<sup>[23, 29]</sup> reported the impact of different professions on attitude toward disabilities. One study<sup>[29]</sup>suggested that music teachers are less likely to respond favorably to children with emotional and behavioral disorders, while physical education teachers often perceive children with orthopedic defects less favorably. The other study<sup>[23]</sup> revealed that X-ray technicians have less positive attitudes toward the people with disability than occupational therapists, nurses, family, doctors and physical therapists. However, few study estimated the influence of income level to the attitudes toward the disabled. It seems that personal income level has no relationship with attitudes toward people with disabilities<sup>[10]</sup>.

## **e) Religion**

Three papers<sup>[18, 23, 30]</sup>had explored the relationship between attitudes and religions. One paper<sup>[30]</sup> stated that religions' beliefs are very significant for comprehending attitudes toward disabled groups, and two others<sup>[18, 23]</sup> found that religion did not affect the attitude on the disabled groups.

### ***3.1.2 Exposure to the disabled***

#### **a) Contact to the disabled**

Eleven studies investigated the relationship between attitude provider's personal contact with the disabled people and attitude scores. Although the results are mixed, the most consistent finding was that people having more contacts with persons with disabilities demonstrated more positive attitude.

i. Frequency/Quantity of the Four studies<sup>[10, 20, 31, 32]</sup> demonstrate that higher frequency of contact was associated with more favorable attitude toward people with disabilities, however, two studies<sup>[14, 33]</sup> found that higher levels of exposure could actually engender more negative attitudes toward people with disabilities.

ii. Quality of the The nature of the contact that people experienced was notably and distinctly related to their attitudes towards the disabled, as shown by two<sup>[33, 34]</sup> studies investigating this area. To specify, higher contact quality predicts a stronger positive attitude, which in turn predicts a lower repulsive attitude<sup>[33]</sup>.

## **b) Familiarity of the disabled**

Many studies found that ever contact with persons with disabilities in the family, friends, social life, or elsewhere, does have a significant impact on their attitudes. Five studies <sup>[18, 21, 35–37]</sup> reported that contacting with a disabled family member, schoolmates, friend or colleague was significantly associated with more favorable attitudes. Yet, two other studies <sup>[26, 28]</sup> found no relationship between these variables. Another study<sup>[27]</sup> surprisingly found that this association existed in the attitudes towards physical disabilities but was not apparent towards intellectually disabled persons.

## **c) Knowledge about the disabled**

People's knowledge about the disabled was also investigated in several studies. Three of them reported that people who have higher knowledge level would have better attitude toward people with disabilities<sup>[22, 26]</sup> and minimize negative attitudes<sup>[38]</sup>, however, one study<sup>[39]</sup> found that knowledge about the policy act of disabled people is not related to their attitudes.

### **3.1.3 Personality and cognitive factors**

Only one study<sup>[18]</sup> investigated personal self-esteem's impact on their attitudes. It reported that for behavior and positive affection, the higher the self-esteem status, the more positive their attitude was toward deaf and blind peers, but not toward paralyzed and intellectually disabled peers; however, for cognition and negative affect items, self-esteem affected attitudes toward all the disabled groups, except the paralyzed peers.

## **3.2 Factors related to the disabled people**

Relationships between variables related to the disabled and public's attitudes toward them across eight studies are demonstrated in Table 2.

Table 2  
Variables related to people with disabilities

Factors	Ref.	Instruments	Study population and setting	Results
Severity of conditions	[10]	ATTID	Participants: 1605 randomly selected adults Setting: Québec, Canada	Compared with higher functional intellectual disability, public attitudes toward people with lower functional tend to be more negative
	[40]	ADS	Participants: 1853 people with physical disability Setting: Guangzhou, China	Significantly negative correlation between the severity of disability and attitude towards disability
Type of disability	[18]	CATCHs, MAS	Participants: 200 high school and 144 university students Setting: Nijmegen, Netherlands	Regarding the behavior and positive affect, respondents had more positive attitudes toward deaf, blind and paralyzed persons than toward intellectually disabled persons.  Regarding the cognition and negative affect, respondents had more positive attitudes toward deaf and blind persons than toward paralyzed and intellectually disabled persons.
	[30]	The Teacher Integration Attitudes Questionnaire	Participants: Teachers of physical education (56) and music education (54) Setting: University of Kansas, United States	Children with emotional and behavioral disorders are considered less favorable by music education teachers, whereas children with orthopaedic disabilities are considered less favorable by teachers of physical education.
	[41]	Students' Attitudes toward People with a Disability Scale	Participants: 406 secondary school students Setting: Hong Kong	Compared with people with physical, visual or hearing impairment, students had poorer attitudes toward people with intellectual impairment and ex-mentally ill.

ATDP, The Attitudes toward Disabled People; CATCHs, The Chedoke-McMaster Attitudes Toward Children with Handicaps; ATTID, The Attitudes Toward Intellectual Disability; MAS, Multidimensional Attitudes Scale toward Persons with Disabilities; ADS, The Attitude to Disability Scale; SADP, Scale of Attitudes towards Disabled Persons

Factors	Ref.	Instruments	Study population and setting	Results
	[31]	A picture-ranking interview of specific physical disabilities	Participants : 54 children with craniofacial anomalies and 68 healthy children  Setting: Negros, Philippines	(1) Girls show lower preference for obesity and higher preference for the arm-hand deformity. Boys, however, are more positive toward those in wheelchairs and less positive toward arm  (2) Children with facial abnormalities have lower preferences than other physical disabilities.
	[33]	SADP	Participants : 338 Chinese students in three Hong Kong secondary schools  Setting: Hong Kong	Chinese students have higher ratings for physically disabled people than those with emotional disturbances or mental retardation
	[23]	ATDP-Form B	Participants: 634 college students, and 234 healthcare professionals  Setting: Tel Aviv University, Israel	The attitudes toward ill persons were more negative than attitudes toward injured persons, but reactions to the specific individuals presented in the vignettes were not affected by their being ill or injured.
Gender	[23]	ATDP-Form B	Participants: 634 college students, and 234 healthcare professionals  Setting: Tel Aviv University, Israel	(1) Among students, gender of the disabled was unrelated to attitudes toward them  (2) Among professionals, their attitudes toward male patients were more negative than toward female patients
ATDP, The Attitudes toward Disabled People; CATCHs, The Chedoke-McMaster Attitudes Toward Children with Handicaps; ATTID, The Attitudes Toward Intellectual Disability; MAS, Multidimensional Attitudes Scale toward Persons with Disabilities; ADS, The Attitude to Disability Scale; SADP, Scale of Attitudes towards Disabled Persons				

### 3.2.1 Severity of the disability

Two studies <sup>[10, 40]</sup> estimated the extent to which the severity of disability on public attitude, which reported a significant negative correlation between the level of severity and attitudes toward them.

### 3.2.2 Type of disability

There are six <sup>[18, 23, 29, 30, 32, 41]</sup> studies examining type of disability as an influential factor of attitudes. Specifically, one research<sup>[18]</sup> found that regarding the behavioral and positive affective aspects of attitudes, respondents have more positive attitudes toward the deaf, paralyzed, and blind than intellectually disabled people. In the same study, regarding the cognitive and negative affective aspects of attitudes, both the paralyzed and the intellectually disabled were regarded with a less positive attitude than the blind and deaf. The other study<sup>[23]</sup> demonstrated that healthcare professionals showed lesser positive attitudes toward disabled people caused by illness than by injury, but these attitude differences usually do not show up during social contacts. Furthermore, people with physical disabilities are more accepted by the public, compared to those with mood disorders and mental retardation<sup>[32]</sup>. When it comes to children particularly, evidence shows that children depicted with facial anomalies received lower preference, compared with other visible physical disabilities<sup>[30]</sup>.

### 3.2.3 Gender

One study<sup>[23]</sup> found that attitudes toward female patients were more positive than toward male patients, although this result may not be consistent when responders are students.

## 3.3 Factors related to society

Only one study <sup>[42]</sup> reported relationships between media and public's attitudes toward the disabled, which showed that when controlling for gender, and contact, people who viewed the humorous media had significantly more positive attitudes to the disabled than people who did not view it. The result is demonstrated in Table 3.

Table 3  
Factors related to the society

Factors	Ref.	Instruments	Study population and setting	Results
Media	[42]	ATDP	Participants: 133 undergraduate students majoring in business  Setting: university in the southeastern, United States	Controlling for age, gender, and exposure to people with disabilities, people who watched humorous video were more positive about people with disabilities than those who didn't.
ATDP, The Attitudes toward Disabled People				

Table 4  
Quality of the included studies

Ref.	sample	measurement	analyses
10	00	00	00
14	000	00	000
21	00	00	000
22	00	00	00
18	00	00	00
20	000	00	000
23	00	00	00
19	00	00	00
24	00	000	00
25	00	00	000
26	000	00	000
27	00	00	000
28	00	00	00
35	000	00	000
36	00	000	00
32	00	00	00
39	00	000	00
34	000	00	00
31	00	00	00
33	00	000	00
29	00	00	00
40	000	000	000
41	00	000	00
30	00	000	00
42	00	00	000
37	000	00	000
38	00	00	000

## 4. Discussion

### 4.1 Key findings and implications

Public attitude is crucial to the disabled people with regard to their daily lives, social participation, and their integration into the community. The present systematic review of 27 studies was performed to identify different aspects of factors that may influence public's attitude toward people with a disability. Three categories were found to be associated with the public factors, which are related to the attitude holder/provider, disabled people, and society respectively. The key findings from this study suggested that, among a variety of factors under each category, the most important ones are the knowledge of the disabled and the contact with the disabled.

The findings from this review also indicated that gender was linked to attitudes, with men have a more negative attitude toward the person with disability than women<sup>[10, 18-22]</sup>. This is likely due to the nature of women's work. To specify, with comparison to men, women choose human service professions more often and therefore have more opportunities in contacting with person with disabilities, which could lead to more positive attitudes toward the disabled. Besides, maternal feelings and cultural differences in the society may be responsible for the higher attitude scores<sup>[22]</sup>. Of note, it seems that gender only influences certain components of attitudes toward the person with disability. For instance, De Laat et al.<sup>[18]</sup> found that females had more negative attitude on cognition and negative affection, but not on behavior and positive affection. The reason for this may be that girls act more aggressively regardless of their beliefs and knowledge, while boys tend to act more in line with their beliefs. This difference between male and female therapists/professionals could have implications for healthcare outcomes as well as attitudes towards the disabled and the decision to work with them.

Among all discussed factors, the finding concerning the relationship between "contact to the disabled" and the attitudes is the most-frequently discussed one. The manifestation of contact include the time length, frequency and the quality of contact with disabled people, or having friends, family members and colleagues who are disabled ("Familiarity"). The majority of studies<sup>[10, 18, 20, 22, 25, 27, 31-36, 39, 41]</sup> have found that contacting with people with disabilities could lead to more positive attitudes towards them. This finding may because more contact could help to reduce fear and anxiety, and create a more balanced and realistic perspective about people with disability regarding to their functional capacity and ability<sup>[10, 21, 25]</sup>. Evidence shows that people who come into contact with the disabled would consider themselves more valuable in the social life and will less likely approach the disabled with rejection<sup>[22]</sup>. However, it is worth noting that without controlling demographics variables and the quality of the contact, the attitude toward disabled people would be negative. To illustrate, when the contact quality is not specifically considered, greater exposure may unexpectedly lead to uncomfortable or unpleasant feeling, and people may associate these bad experiences with the disabled people themselves<sup>[33]</sup>. Thus, it is important to consider the quality and quantity of the contact together rather than mere quantity alone in order to promote the attitudes. Although there are few studies<sup>[26, 28]</sup> found no significant difference

between attitude and contact, the reasons under that is explainable (i.e., the lack of planned relationships between students and disabled people, or the low frequency of such relationships). Therefore, we believe that under certain contact conditions, it is necessary to know about disability in advance in order to improve the attitude towards disability. Reducing anxiety between groups and creating an environment that could not only reduces prejudice, but also promote interactions in a more enjoyable way, suggest a continuous cycle of benefits.

We found that almost all studies indicated the education level was positively linked to attitudes. People with higher levels of education may be more liberal, open and understanding of people with disabilities and related issues, which let them have a better attitude towards people with disabilities<sup>[43]</sup>. This tends to support that active interactive education could consider as a means to enhance public awareness and acceptance of people with disabilities<sup>[44]</sup>. Therefore, cooperation with disabled people can become an important part of education for the public in the future. More importantly, developing and implementing disability-specific and high quality education curricula as a part of healthcare providers' professional program to enhance their attitude towards the disabled needs to be considered by the decision-makers.

Our results showed a lack of consistency for some factors. To illustrate, the findings concerning the relationship between the age of the respondent and their attitudes are not consistent. Some studies suggested that younger people hold more negative attitudes toward person with disabilities than the older<sup>[18, 21, 24, 25, 27]</sup>, while opposite findings were also reported in many other studies<sup>[10, 14, 19, 26]</sup>. This may because the participants' characteristics of each study<sup>[18, 21]</sup> are not homogeneous, and more likely, the results were not controlled by other potential explanatory factors, e.g., knowledge about the disabled, or the contact with them<sup>[25]</sup>. For example, some health professionals were offered a series of programs which aims to eliminate stereotypes on disabled people, then their previous experience in dealing with the disabled and their views on the disabled may explain the difference in their attitudes compared others who weren't trained<sup>[19, 26]</sup>. Previous research stated that knowledgeable about people with disabilities and related issues could lead people to have more favorable attitudes toward the disabled<sup>[43]</sup>. The knowledge of the disabled might also inform selection to the medical profession, or specific training programs within healthcare medicine. Therefore, this may provide an insight that we should pay more attention to the education of young people regarding the disability issues, and increase their contact time length with the disabled people appropriately as well. Thus, in designing future evaluations, researchers should bear in mind that studies that randomly assign participants to groups can provide reliable evidence about the effects of age.

With regard to other potential factors (religion, income and humorous media), religion and income were found to have no effect on people's attitudes towards disabled people, while humorous media have a positive impact. Evidence suggest that humor may have a normalizing effect during an abnormal situation<sup>[45]</sup>, and its impact on reducing anxiety is well documented in many fields in several studies<sup>[46-48]</sup>. Another possible explanation could be that humorous introductions provide a non-threatening and less anxious means of inserting constructive images of disability into mainstream culture to communicate

information about disability<sup>[49]</sup>. Thus, it is recommended to use a comprehensive humorous approach to provide information on persons with disabilities, which could become an effective way to change negative attitudes<sup>[50]</sup>.

In addition to the factors discussed above, it is found that public attitude is also dependent upon the individual factor of the disabled, e.g., type of disability. Several studies<sup>[18, 32, 41]</sup> found that, among all the disability types, attitudes toward persons with intellectually/mentally disabled are less positive than those with other types. On the other hand, people tend to have less positive attitude toward the individuals with more visible physical impairment<sup>[30, 34]</sup>. A possible reason behind this finding is based on the idea that persons with intellectual disability are unpredictable in their behavior and as such pose a threat<sup>[10, 18]</sup>. Moreover, people tend to have less positive attitude toward the individuals with more visible physical impairment<sup>[30]</sup>. To specify, public always hold less negative attitudes to the blind and deaf compared to the paralyzed and the intellectually disabled<sup>[18]</sup>, which maybe because a paralysis and intellectual disability are more visible than deafness and blindness, and people with facial anomalies receive less preference compared to those with other physical disabilities.

## 4.2 Measurement employed

In this review we found that the included studies used a great variety of scales to evaluate the attitudes toward the disabled people, and the ATDP (Attitude Towards Disabled People)<sup>[51]</sup> was the most used one by nine studies<sup>[20, 22-24, 26-28, 36, 42]</sup>. This instrument was developed in 1960, and has three forms: form O is the original form with 20 items; form A and form B, both with 30 items, are improved versions of form O. It is a research-validated instrument for measuring generalized attitudes toward persons with general disabilities. ATDP has sound psychometric properties which have demonstrated reliability and content and construct validity evidence<sup>[51, 52]</sup>. A further included 2 studies<sup>[27, 32]</sup> used SADP (Scale of Attitudes Towards Disabled Persons)<sup>[53]</sup>, which was developed in 1981 to provide an alternative to the ATDP Form-O to measure the general population's attitudes towards disabilities in general. SADP has also been found to be reliable and content validated<sup>[53]</sup>. These two scales-ATDP and SADP, are both appropriate for research that consider general participants and not limited to contact with one type of disability. Although they are widely used and extensively researched in the contemporary studies, they couldn't used to reflect the impact of difference between persons with different disabilities. Other instruments used in else included studies measure specific dimensions of attitudes toward specific disabilities (e.g., ATTID, The Attitudes Toward Intellectual Disability<sup>[54]</sup>) within specific contexts (e.g., CLAS-MR, the Community Living Attitudes Scale-Mental Retardation<sup>[55]</sup>), or for specific age groups (e.g., CATCHs, The Chedoke-McMaster Attitudes Toward Children with Handicaps<sup>[56]</sup>). Whether studies have reported the psychometric properties of the chosen measure of attitudes to indicate their validation was not part of our eligibility criteria of inclusion. To note, a latest study in 2020<sup>[57]</sup> mentioned another popular tool to measure the attitudes towards the disabled in various aspects- the Attitudes to Disability Scale (ADS) developed by the

WHOQOL Group<sup>[58]</sup>, which was proved to be useful and reliable for the whole society in general. Future studies could consider employ this measurement as well.

## 4.3 Knowledge gaps

Among the included studies, there is a lack of evidence about a progression or improvement in attitudes occurred as time passed. To date, long-term prospective studies that evaluate changes in attitude across time are needed, in order to better understand the best way to cultivate positive attitudes from education to practice. As noted, most of the literatures reviewed in this study were based on student samples, which rendering their findings unrepresentative of the general public. And the diversity of the assessment instrument used may obfuscate the results to be applied generally. Future studies assessing attitudes toward people with disabilities need to use more rigorous design and validated measurement so a future meta-analysis may be feasible.

According to our search results, compared to factors related to the attitude provider, social factors and factors related to the disabled themselves were less studied, which indicates the need to be further studied in the future and is worthy of more in-depth study. There is limited evidence of the relationship between income level and the attitudes in the current studies. Future study could also situate the current findings within a broader context such as links to bodies of research on stigma, empathy/fatigue in healthcare providers. Besides, as the reviewed literature originated from different countries, possible cultural differences should be taken into account when establishing such a guide for the future studies in this area.

## 5. Strengths And Limitation Of This Review

### 5.1 Strength

We sought to provide as comprehensive an overview of attitudes toward the disabled as possible, rather than focusing on a specific angle (e.g., specified type of disability) in this area. We have not identified any previous study that attempted to systematically review the attitudes of the general public toward people with all kinds of disabilities, which makes our review meaningful. We extracted the data related to the factors, setting, sample, instruments employed, and the results of each study, which could provide a clear awareness of the feature of the included studies, and provide the insight of the current knowledge gaps to inform further studies in this area. The findings of this study have important implications for future health professional education and training.

### 5.2 Limitation

Only English records were retrieved in this review, which means that insights from paper written in other languages could have been missed, and the language and publication bias may be present. Another

limitation is the decision to exclude records from the qualitative study and grey literature, which may decreased the breadth of insights generated. Standardized tools weren't used in this study to do the methodological quality assessment procedure, and only descriptive analysis evaluation was taken. It is uncertain which factors will be most important since the relative importance of each factor wasn't considered sufficiently. We are unable to meta analyze the results given the heterogeneous nature of the included data in terms of study design, populations studied, and instruments used.

## 6. Conclusion

This systematic review identified three categories related to the factors associated with attitudes toward the disabilities, which indicate an association with attitudes towards the disabled: factors related to the attitude provider, disability themselves, and the society. Among all of the factors, provider's knowledge of the disability and their contact with the disabled are most important ones that influence attitude towards people with disabilities. ATDP scale was most used to measure attitudes in the included studies. Additional focus may be necessary for future study to randomly assign participants (student and non-student sample) to provide more representative and comprehensive evidence. Future research should aim to establish a practical guide based on these factors proved to be influential, which would help not only the health care professionals but the general lay public as well, to realize disabled individuals approaches, and inform effective decisions to the stakeholders in order to build a more inclusive society.

## Abbreviations

ADA, The Americans with Disabilities Act; ADS, The Attitudes to Disability Scale; ATDP, The Attitudes toward Disabled People; CATCHs, The Chedoke-McMaster Attitudes Toward Children with Handicaps; ATTID, The Attitudes Toward Intellectual Disability; CAMI, The Community Attitudes Towards Mental Illness Scale; CLAS-MR. the Community Living Attitudes Scale—Mental Retardation Form; DSDS, The Disability Social Distance Scale; GNAT, A Go/No-go Association Task; ID, Intellectual Disabilities; IDD, Intellectual and Developmental Disability; IM4Q, Independent Monitoring for Quality; MAS, Multidimensional Attitudes Scale toward Persons with Disabilities; MRAI-R, The Mental Retardation Attitude Inventory-Revised; SADP, Scale of Attitudes towards Disabled Persons; TATDP-Turkish Attitudes towards Disabled Person Scale.

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## Consent for publication

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# Competing interests

The authors declare that they have no competing interests.

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# References

1. Lee R, *The demographic transition: three centuries of fundamental change*. Journal of economic perspectives 2003;**17**(4): 167-90.
2. World Health Organization, *World report on disability*. 2011, Geneva, Switzerland: World Health Organization.
3. Murray CJL, Vos T, Lozano R, et al. *Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010*. The Lancet 2012;**380**(9859): 2197-223.

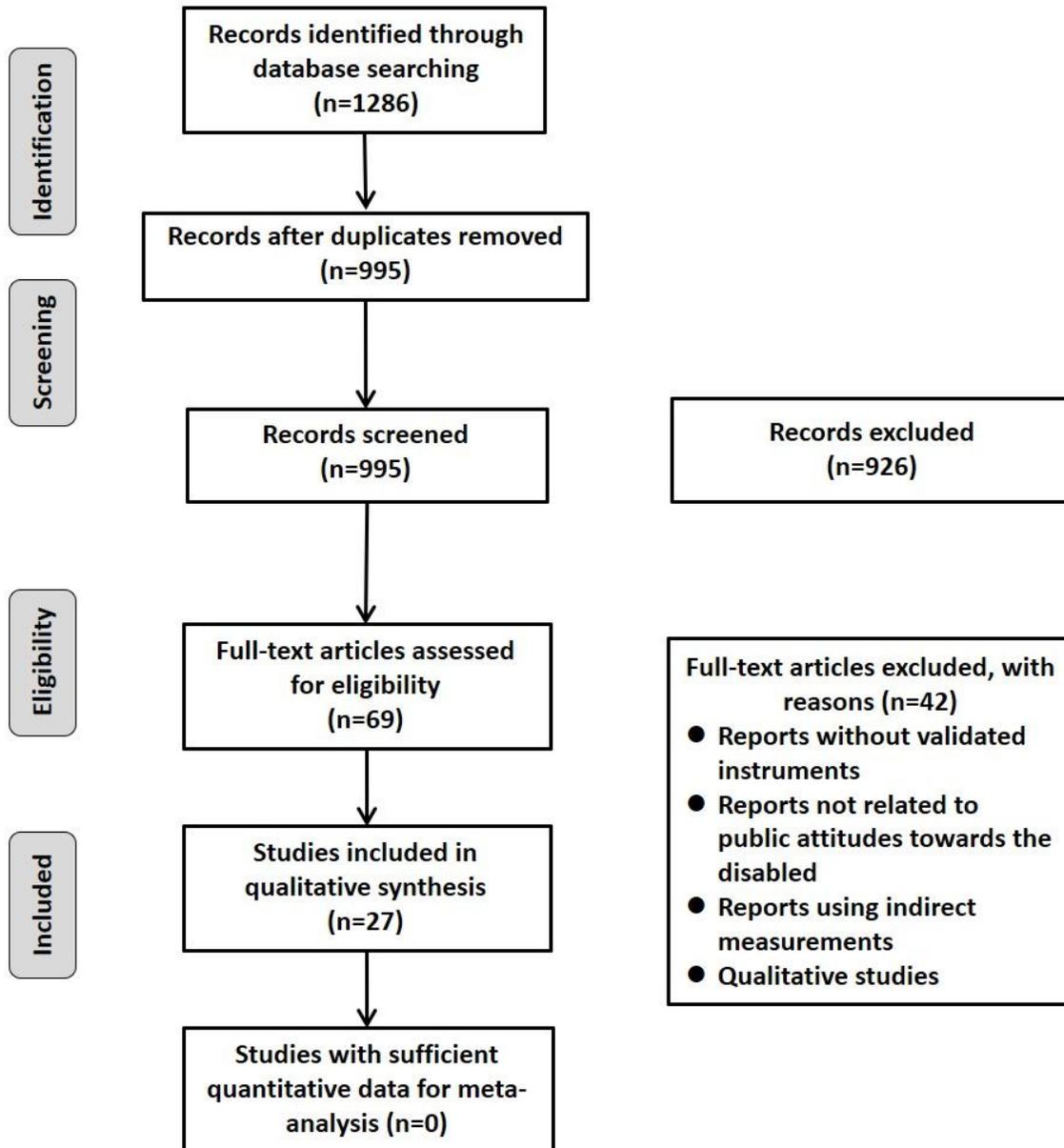
4. Malla A, Shaw T, *Attitudes Towards Mental Illness: the Influence of Education and Experience*. International Journal of Social Psychiatry 1987;**33**(1): 33-41.
5. Seltzer MM, *Correlates of community opposition to community residences for mentally retarded persons*. Am J Ment Defic. 1984;89(1):1-8.
6. Dunn DS, *The Oxford handbook of undergraduate psychology education* 2015; Oxford University Press.
7. Findler L, Vilchinsky N, Werner S, *The Multidimensional Attitudes Scale toward Persons with Disabilities (MAS): Construction and Validation*. Rehabilitation Counseling Bulletin 2007;**50**(3):166-76.
8. Kleintjes S, Lund C, Swartz L, *Barriers to the participation of people with psychosocial disability in mental health policy development in South Africa: a qualitative study of perspectives of policy makers, professionals, religious leaders and academics*. BMC International Health and Human Rights 2013;**13**(1): 1-10.
9. Rimmer JH, Riley B, Wang E, Rauworth A, Jurkowski J, *Physical activity participation among persons with disabilities: barriers and facilitators*. American journal of preventive medicine 2004;**26**(5): 419-25.
10. Morin D, Rivard M, Crocker AG, Boursier CP, Caron J, *Public attitudes towards intellectual disability: a multidimensional perspective Attitudes on intellectual disabilities*. Journal of Intellectual Disability Research 2013;**57**(3): 279-92.
11. Verdonschot MML, de Witte LP, Reichrath E, Buntinx WHE, Curfs LMG, *Impact of environmental factors on community participation of persons with an intellectual disability: a systematic review*. Journal of Intellectual Disability Research 2009;**53**(1): 54-64.
12. Scior K, *Public awareness, attitudes and beliefs regarding intellectual disability: A systematic review*. Research in developmental disabilities 2011;**32**(6): 2164-82.
13. Burge P, Ouellette-Kuntz H, Lysaght R, *Public views on employment of people with intellectual disabilities*. Journal of Vocational Rehabilitation; 2007;**26**(1): 29-37.
14. Zheng Q, Tian Q, Hao C, et al. *Comparison of attitudes toward disability and people with disability among caregivers, the public, and people with disability: findings from a cross-sectional survey*. BMC public health 2016; **16**(1): 1024.
15. Murchison C, *A handbook of social psychology*. 1935.
16. Antonak RF, Livneh H, *Measurement of attitudes towards persons with disabilities*. Disability rehabilitation 2000;**22**(5): 211-24.
17. McCaughey TJ, Strohmer DC, *Prototypes as an indirect measure of attitudes toward disability groups*. Rehabilitation Counseling Bulletin 2005; **48**(2): 89-99.
18. de Laat S, Freriksen E, Vervloed MPJ, *Attitudes of children and adolescents toward persons who are deaf, blind, paralyzed or intellectually disabled*. Research in Developmental Disabilities 2013;**34**(2): 855-63.

19. Goreczny AJ, Bender EE, Caruso G, Feinstein CS, *Attitudes toward individuals with disabilities: Results of a recent survey and implications of those results*. Research in Developmental Disabilities 2011;**32**(5):1596-609.
20. Paris MJ, *Attitudes of medical students and health-care professionals toward people with disabilities*. Archives of physical medicine and rehabilitation 1993;**74**(8): 818-25.
21. Patka M, Keys CB, Henry DB, McDonald KE, *Attitudes of Pakistani community members and staff toward people with intellectual disability*. American journal on intellectual and developmental disabilities 2013;**118**(1): 32-43.
22. Sahin H, Akyol AD, *Evaluation of nursing and medical students' attitudes towards people with disabilities Students' attitudes towards people with disabilities*. J Clin Nurs. 2010; doi:10.1111/j.1365-2702.2009.03088.x
23. Shiloh S, Heruti I, Berkovitz T, *Attitudes toward people with disabilities caused by illness or injury: beyond physical impairment*. International Journal of Rehabilitation Research 2011;**34**(4): 321-29.
24. Vincent-Onabajo GO, Malgwi WS, *Attitude of physiotherapy students in Nigeria toward persons with disability*. Disability and Health Journal 2015;**8**(1): 102-8.
25. Hsu TH, Huang YT, Liu YH, Ososkie J, Fried J, Bezyak J, *Taiwanese attitudes and affective reactions toward individuals and coworkers who have intellectual disabilities*. American journal on intellectual and developmental disabilities 2015;**120**(2):110-24.
26. Uysal A, Albayrak B, Koçulu B, Kan F, Aydın T, *Attitudes of nursing students toward people with disabilities*. Nurse Education Today 2014; **34**(5): 878-84.
27. Ten Klooster PM, Dannenberg J-W, Taal E, Burger G, Rasker JJ, *Attitudes towards people with physical or intellectual disabilities: nursing students and non-nursing peers*. Journal of Advanced Nursing 2009;**65**(12): 2562-73.
28. Oermann MH, Lindgren CL, *An Educational Program's Effects on Students' Attitudes Toward People with Disabilities: A 1-Year Follow-Up*. Rehabilitation Nursing 1995; **20**(1):6-10.
29. Sideridis GD, Chandler JP, *Comparison of attitudes of teachers of physical and musical education toward inclusion of children with disabilities*. Psychological Reports 1996; **78**(3): 768-70.
30. Harper DC, Peterson DB, *Children of the Philippines: Attitudes toward visible physical impairment*. The Cleft palate-craniofacial journal 2001; **38**(6): 566-76.
31. Shields N, Taylor NF, *Contact with Young Adults with Disability Led to a Positive Change in Attitudes toward Disability among Physiotherapy Students*. Physiotherapy Canada 2014; **66**(3): 298-305.
32. Chan F, Hedl JJ, Parker HJ, Lam CS, Chan TN, Yu B, *Differential attitudes of Chinese students toward people with disabilities: a cross-cultural perspective*. The International journal of social psychiatry 1988; **34**(4):267-73.
33. Keith JM, Bennetto L, Rogge RD, *The relationship between contact and attitudes: Reducing prejudice toward individuals with intellectual and developmental disabilities*. Research in developmental disabilities 2015; **47**: 14-26.

34. Eberhardt K, Mayberry W, *Factors influencing entry-level occupational therapists' attitudes toward persons with disabilities*. The American journal of occupational therapy : official publication of the American Occupational Therapy Association 1995;**49**(7): 629-36.
35. Stachura K, Garven F, *A national survey of occupational therapy students' and physiotherapy students' attitudes to disabled people*. Clinical rehabilitation 2007; **21**(5): 442-9.
36. Lawson JE, Cruz RA, Knollman GA, *Increasing positive attitudes toward individuals with disabilities through community service learning*. Research in developmental disabilities 2017; **69**: 1-7.
37. Alnahdi GH, *The positive impact of including students with intellectual disabilities in schools: Children's attitudes towards peers with disabilities in Saudi Arabia*. Research in developmental disabilities 2019; **85**: 1-7.
38. Shahif S, Idris DR, Lupat A, Rahman HA, *Knowledge and attitude towards mental illness among primary healthcare nurses in Brunei: A cross-sectional study*. Asian journal of psychiatry 2019; **45**: 33-7.
39. Copeland J, Chan F, Bezyak J, Fraser RT, *Assessing cognitive and affective reactions of employers toward people with disabilities in the workplace*. Journal of occupational rehabilitation 2010;**20**(4): 427-34.
40. Zheng Q, Tian Q, Hao C, et al. *The role of quality of care and attitude towards disability in the relationship between severity of disability and quality of life: findings from a cross-sectional survey among people with physical disability in China*. Health quality of life outcomes 2014;**12**(1): 25.
41. Wong DKP, *Do contacts make a difference? : The effects of mainstreaming on student attitudes toward people with disabilities*. Research in Developmental Disabilities 2008;**29**(1): 70-82.
42. Smedema SM, Ebener D, Grist-Gordon V, Smedema, SM, Ebener D, Grist-Gordon V, *The impact of humorous media on attitudes toward persons with disabilities*. Disability and Rehabilitation 2012;**34**(17): 1431-7.
43. Lau JT-f, Cheung C-k, *Discriminatory attitudes to people with intellectual disability or mental health difficulty*. International Social Work 1999; **42**(4): 431-44.
44. Desforges DM, Lord CG, Ramsey SL, et al. *Effects of structured cooperative contact on changing negative attitudes toward stigmatized social groups*. Journal of personality social psychology 1991;**60**(4): 531.
45. Germeroth KSD, *Should we laugh or should we cry? John Callahan's humor as a tool to change societal attitudes toward disability*. Howard Journal of Communication 1998;**9**(3):229-44.
46. Maples MF, Dupey P, Torres-Rivera E, Phan LT, Vereen L, Garrett MT, *Ethnic diversity and the use of humor in counseling: Appropriate or inappropriate?* Journal of Counseling Development 2001;**79**(1): 53-60.
47. Richman J, *The lifesaving function of humor with the depressed and suicidal elderly*. The Gerontologist 1995;**35**(2): 271-5.
48. Goldstein KD, *A comparative study of university students, professionals, and community attitudes toward mental retardation*. Dissertation Abstracts International 1979; **39**(9): 544-46.

49. Haller B, *DSQ symposium, disability & humor*. Disability Studies Quarterly 2003; **23**(3):1-3.
50. Lee T, Rodda M, *Modification of attitudes toward people with disabilities*. Canadian Journal of Rehabilitation 1994; **7**(4): 229-38.
51. Yuker HE, *The measurement of attitudes toward disabled persons*. Human Resources Center; 1970.
52. Tervo RC, Palmer G, *Health professional student attitudes towards people with disability*. Clinical rehabilitation 2004; **18**(8):908-15.
53. Antonak RF, *Development and psychometric analysis of the Scale of Attitudes Toward Disabled Persons*. Journal of Applied Rehabilitation Counseling 1982; **13**(2): 22-9.
54. Morin D, Crocker A, Beaulieu-Bergeron R, Caron J, *Validation of the attitudes toward intellectual disability-ATTID questionnaire*. Journal of Intellectual Disability Research 2013; **57**(3): 268-78.
55. Henry D, Keys C, Jopp D, Balcazar F, *The community living attitudes scale, mental retardation form: Development and psychometric properties*. Mental retardation 1996; **34**(3): 149.
56. Rosenbaum PL, Armstrong RW, King SM, *Children's attitudes toward disabled peers: A self-report measure*. Journal of Pediatric Psychology 1986; **11**(4): 517-30.
57. Załuska U, Grześkowiak A, Kozyra C, Kwiatkowska-Ciotucha D, *Measurement of Factors Affecting the Perception of People with Disabilities in the Workplace*. International Journal of Environmental Research and Public Health 2020; **17**(12): 4455.
58. Power M, Green A, Group WD, *The Attitudes to Disability Scale (ADS): development and psychometric properties*. Journal of Intellectual Disability Research 2010; **54**(9): 860-74.

## Figures



**Figure 1**

Study selection process