

**ORIGINAL PAPER**

## **Empathy Levels in Undergraduate Paramedic Students**

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**Abstract**

**Introduction** Empathetic behaviour is regarded as a positive trait amongst healthcare professionals and has been attributed to increased patient compliance, greater patient satisfaction, and greater diagnostic accuracy and reduced rates of clinical errors. Despite this, past studies have shown that healthcare students fail to recognise the importance of empathetic behaviour in patient care and display significant empathy decline throughout their studies. In particular, paramedic students have typically displayed lower rates of empathy when compared to their healthcare counterparts. The objective of this study is to assess both the level of empathy and changes in empathy in undergraduate paramedic students over a 3-year period at a single tertiary institution.

**Method** A cross sectional study employing a convenience sample of first, second and third year undergraduate paramedic students at Monash University from 2008-2010. Student empathy scores were measured with the Jefferson Scale of Empathy – Health Profession Student version (JSE-HPS); a validated, self-reporting questionnaire.

**Results** 552 students were enrolled in the study, of which 69% were females and 83% were aged under 25. The mean overall JSE-HPS score for the cohort was 108.60 (SD=12.50). Female students displayed significantly higher empathy scores of 110.27 (SD=11.62) compared to males at 105.36 (SD=13.57). There was also a significant difference ( $p=0.03$ ) noted between the 2008 JSE-HPS score 106.32 (SD=14.02), when compared to the 2009 cohort, 110.18 (SD=12.91). There was no significant difference found in mean JSE-HPS scores across differing age groups.

**Conclusion** Results from this study suggest that paramedic students display lower empathy than those reported by fellow healthcare students within the literature. Additionally, this study provides further evidence that females are typically more empathetic than their male counterparts in the same profession. The fact that empathy levels did not decline significantly throughout the course as expected defies current literature and is worthy of future investigation.

**Keywords:** Empathy, Undergraduates, Paramedics

**Introduction:**

Within the fields of both medicine and allied healthcare, approaching patient care with a heightened level of empathetic behaviour has been shown to achieve greater positive

outcomes (Hemmerdinger, 2007, Yu, 2009, Hojat, 2011). Such benefits include an increase in patient compliance and greater patient satisfaction through achieving a more humanistic relationship between patient and healthcare provider (Boyle et al., 2010,

Williams et al., 2012, Brown, 2011, Hojat, 2005). For the medical professional too, heightened empathetic behaviour can enable greater diagnostic accuracy and minimise the rate of clinical errors and lapses in professional behaviour (Hojat, 2003, Boyle et al., 2010, Hojat et al., 2013b).

Despite the presence of such overwhelming support for the benefits of an empathetic approach, there remains no universally agreed upon definition in relation to its implementation in patient care. Much of the literature supports the belief that both cognitive and emotional empathy approaches (Regehr et al., 2002) are multi-faceted and differentiated from sympathy through the identification of other's feelings whilst limiting personal involvement and maintain clinical neutrality (Dziobek, 2008, Derntl et al., 2010, Ziolkowska-Rudowicz and Kładna, 2010, Fields, 2011, Dyrbye, 2012). When used in relation to the healthcare context, empathy has frequently been described as a "predominately cognitive attribute (rather than emotional) that involves an understanding (rather than feeling) of experiences, concerns and perspectives of the patient, combined with the capacity to communicate this understanding" (Hojat, 2007). Specific to the out-of-hospital setting (Regehr et al., 2002) reiterates a cognitive approach to empathy in which paramedics can develop an internal frame of reference where they can both consider the consequences of actions on the welfare of others and continue to work in the best interest of patients. An example of such positive empathetic behaviour is often found in cases of SIDS patients, where appropriate displays of empathy by paramedics have been found to have been of substantial importance and comfort for parents throughout the grieving process (Nordby and Nøhr, 2008). Similarly too, paramedics are typically a patient's first point of contact in a medical crisis.

The empathy displayed by paramedics, despite being over a short duration and often in highly emotional environments (Wahlin, 1995), is often affirming of how that patient will perceive other medical professionals throughout their exposure to a variety of

health services (Williams et al., 2011, Williams et al., 2014).

Despite the compelling evidence highlighting the importance of empathy in patient care, current literature suggests that undergraduate health students of today not only display less empathy than previous generations (Konrath, 2011), but also fail to acknowledge the importance of the skill (Fields, 2011). Similarly too, empathy has been shown to decline through the course of tertiary study amongst a variety of healthcare students. In a 2011 study, (Nunes et al., 2011) identified a statistically significant decline in empathy scores in medical, nursing and dental students through the progression of their studies. In this instance it was suggested that such a decline in empathy can be both associated with the 'settling in' effect of beginning a new course and a change from idealism to realism, as well as being an adaptive response to increased responsibilities and workload. This has particularly been the case amongst paramedic students, with previous studies highlighting lower medical regard and empathy for specific stigmatised patient groups (Williams et al., 2011, Boyle et al., 2010, Williams et al., 2012, Williams et al., 2010).

Whilst being a personal trait, empathy is also a tangible skill (Kliszcz et al., 2006). As such, it is believed that empathetic approaches of healthcare students can be improved through intervention with appropriate teaching styles (Nunes et al., 2011, Dereboy et al., 2005). When taught within a tertiary curriculum, empathy studies typically occur during studies relating to professional behaviour such as the use of verbal and non-verbal communication skills and establishing rapport with patient (Boyle et al., 2010). An integrated approach to empathy studies involving role play and simulation is rarely utilised in health professions, despite its use displaying a direct increase in empathetic regard (Brunero, 2010). Such evidence however is important in recognising that both tertiary institutions and professional industries can play significant roles in developing empathy amongst paramedic undergraduates.

Whether empathy has been formally integrated and aligned with learning activities or assessment in national paramedic programs is less clear. The objective of this study was to assess both the level of empathy and changes in empathy in undergraduate paramedic students over a 3-year period at a single tertiary institution.

## **Methods:**

### ***Study Design***

A cross sectional study employing a paper-based questionnaire with convenience sampling of undergraduate student paramedics from a large Australian University.

### ***Population and Setting***

The study was conducted within the Department of Community Emergency Health and Paramedic Practice at the Peninsula Campus of Monash University, Victoria, Australia. Monash University delivers both a Bachelor of Emergency Health (paramedic) and a double degree offering an additional Bachelor of Nursing of which both are pathways to attaining employment within an Australian Ambulance Service. All undergraduate paramedic and double degree nursing/paramedic students were invited to participate in the study, with the only inclusion criteria being that students were currently enrolled in either of the aforementioned courses. Enrolment in the study occurred annually during Semester one (March) between 2008-2010.

### ***Instrumentation***

Student empathy levels were measured using a standardised self-reporting instrument: the Jefferson Scale of Physician Empathy – Health Profession Student Version (JSPE-HPS). Originally developed for physicians and medical students (Hojat, 2007, Hojat, 2001), the scale has been validated and shown to be a reliable tool in numerous health professions (Sherman and Cramer, 2005, Fields, 2004, Hojat et al., 2002). The JSPE-HPS has been specifically modified for administration to students with promising results supporting the use of this modified

version amongst a variety of healthcare professions (Fields, 2011).

The JSPE-HPS itself is a 20-item questionnaire, 10 of which are negativity worded and reverse scored. Delivered using a 7-point Likert scale for each item students are provided with a statement to which they must choose an option between strongly disagree and strongly agree. Possible scores range from 20 – 140, with higher student scores indicative of a greater behavioural tendency toward empathetic engagements during patient care episodes (Hojat, 2002).

### ***Analysis Method***

The Statistical Package for Social Sciences (SPSS; Version 19.0) was used for data storage, tabulation, and the generation of descriptive statistics. Means were used to describe the descriptive data and an independent samples t-test and Analysis of Variance (ANOVA) were used to determine if any differences existed between gender, year of study, and age groups. All tests were two tailed unless otherwise stated, results are considered statistically significant if the *p* value is < 0.05.

### ***Ethics Approval***

Ethics approval was granted by the Monash University Human Research Ethics Committee. At the conclusion of a lecture students were provided with the questionnaire and explanatory statement and were informed that participation in the study was voluntary. A department staff member not affiliated with the study facilitated the process and distribution of the questionnaires, which included both the JSPE-HPS and some brief demographic questions. Consent was implied by the voluntary completion and submission of each questionnaire.

## **Results:**

### ***Participant Demographics***

Between 2008 and 2010, 552 students were enrolled into the study which reflects a response rate of 35.8%. 69% of these students were female and, whilst being disproportionate to the 30% of males, is consistent with enrolment statistics for the

course. The majority of the students were aged in their late teens and early 20s. 77 % of students were aged under 25 years old and only 5% of students aged greater than 31 years old. Second year students made up the largest group participating in the study at 43%. Across each year of the data selection there was no significant difference in the number of students enrolled in the study. The full demographic distributions and cross-tabulation are displayed in tables 1 and 2.

**Table 1: Demographic distribution and mean JSE-HPS scores of study cohort**

<b>Variable</b>	<b>Descriptor</b>	<b>n (%)</b>	<b>Mean JSE-HPS Score (SD)</b>
<b>University</b>	Monash	552 (100)	108.60 (12.50)
<b>Gender</b>	Male	167 (30.8)	105.36 (13.57)
	Female	375 (67.9)	110.27 (11.62)
<b>Age</b>	<21 years	253 (45.8)	108.06 (11.75)
	22-25 years	205 (37.1)	109.18 (13.83)
	26-30 years	49 (8.9)	108.96 (10.51)
	31-35 years	16 (2.9)	110.75 (10.31)
	36-40 years	11 (2.0)	104.36 (13.61)
	41-45 years	12 (2.2)	109.33 (14.74)
	>45 years	5 (0.9)	112.20 (10.91)
<b>Year of Course</b>	First Year	164 (29.7)	108.87 (13.39)
	Second Year	237 (42.9)	110.07 (11.34)
	Third Year	149 (27.0)	106.01 (12.94)
<b>Entry Years</b>	2008	119 (21.6)	106.32 (14.02)
	2009	171 (31.0)	110.18 (12.91)
	2010	262 (47.5)	108.61 (11.32)

**Table 2: ‘Year of Course’ and ‘Study Year’ participant numbers cross-tabulation**

		Study Year			Total
		2008	2009	2010	
Year of Course	First Year	17	98	49	164
	Second Year	62	45	130	237
	Third Year	40	28	82	150
Total		119	171	261	551

**Table 3: Comparison of JSE-HPS Scores across the Study Population**

Scale	Study Year	Year of Course	Age	Gender
JSE-HPS	F = 3.37	F = 4.96	F = 0.137	F = 5.47
	P = 0.035	P = 0.007	P = 0.792	P = <0.0001

Table 3 highlights comparative results and significance across the study groups. The mean 2008 score of 106.32 (SD=14.02) was significantly lower than the 2009 participants at 110.18 (SD=12.91). Mean scores for the 2010 cohort was 108.61 (SD=11.32). Table 2 displays the mean JSE-HPS scores attained by the study participants which was 108.60 (SD=12.50), however this varied considerably across each variable group.

Like previous studies of health professionals’ empathy scores, it was found that females displayed significantly higher empathy scores of 110.27 (SD=11.62) when compared to males at 105.36 (SD=13.57),  $p < 0.0001$ . However, there was no significant difference noted between the JSE-HPS scores of differing age groups within the study

population, with scores ranging between 108.06 (SD=11.75) and 112.20 (SD=10.91),  $p = 0.792$ .

Statistically significant differences ( $p = 0.007$ ) were also noted in self-reported empathy scores in student year levels, with final year students reporting the lowest mean scores: year 1 (108.87, SD=13.39), year 2 (110.07, SD=11.34), and final years (106.01, SD=12.94).

**Discussion**

The data collected in this study builds upon the growing base of knowledge concerning empathy studies within the paramedic profession and its associate undergraduate students. Much of this available data points to generally low empathy levels across a

variety of health professions. In a 2010 survey of 459 undergraduate healthcare students which utilised the JSE, Boyle et al found that 120 paramedic students presented with the lowest empathy score of 106.32 when compared to students in nursing, midwifery, occupational therapy, physiotherapy and health sciences (Boyle et al., 2010). These results are consistent with a larger cross-sectional study conducted in 2012, where Williams et al identified an overall mean JSE-HPS score of 106.74 in 783 paramedic students across 7 major Australian universities (Williams et al., 2012).

Combined with the mean data of this current study, the evidence is suggestive that paramedic students typically display low levels of self-reported empathy. This is particularly prominent when compared to that of other health professions. Boyle et al's above study observed higher mean empathy scores ranging from 107.34 to 111.55 in students studying nursing, midwifery, occupational therapy, physiotherapy and health science (Boyle et al., 2010). Similar studies of medical and nursing students have identified higher mean empathy scores of 118.5 (Chen, 2007), 117.71 (Sherman and Cramer, 2005), 104.3 (Kataoka, 2009) and 107.34 (McKenna, 2012).

Despite an overall mean low JSE-HPS score, there was significant variation in scores within variable groups of the study cohort. Females produced significantly higher JSE-HPS scores when compared to their male counterparts; a result that has been echoed in the previous studies of paramedic student empathy (Boyle et al., 2010, Williams et al., 2012, Williams et al., 2011). In current literature, there is strong suggestion that females are typically more empathetic than males (Boyle et al., 2010, Brown, 2011, Nunes et al., 2011, Hojat, 2004, Chen, 2007, Kliszcz et al., 2006, Harlak et al., 2008, Fields, 2011), for which there are several possible explanations.

Such hypotheses include differing neural circulatory patterns in the women's brain, the result of evolution, a generalised view that

empathy is a feminine trait, predisposition to emotional decision-making, differing societal development, maternal influences and the belief that males typically adopt a more rational than emotional approach (Hojat, 2003, Baron-Cohen, 2004, Han et al., 2008, Derntl et al., 2010, Looi, 2008, Magalhães, 2011). Any of or a combination of these hypotheses may explain the higher empathetic behaviours expressed by female paramedic students. Use of qualitative-based research in future research might reveal or question some of these priori assumptions.

Similarly, there was a significant difference in mean JSE-HPS scores between study years. The 2008 study cohort scored significantly lower than the 2008 study group. There are several possible explanations for this. Education and clinical exposure is said to be a prominent factor in developing and altering student altruism and empathetic behaviours (Branch, 2001, Singh, 2005) and it may be that a modified course model in the dynamic paramedic program delivered in late 2009/early 2010 significantly altered the perception of empathy amongst the students. Other factors found to be responsible for empathy changes such as age, gender differences, previous education, culture and past experiences in the healthcare industry may have further played a role in the witnessed empathy decline in 2010 (Nunes et al., 2011, Kelleher, 2009). This study would benefit from retrospective analysis of demographic data collected in 2010 to identify any possible explanations for this sharp decrease in empathy.

Unlike previous studies, this study found no significant difference JSE-HPS scores between different age groups. In the past, higher empathy trends have been observed in students >27 years old and have been suggested to be the result of life experience and resultant influencing factors on behaviour (Nunes et al., 2011). The reason as to why the researchers observed no difference amongst this study cohort requires further investigation.

Statistically significant differences were found noted in self-reported empathy levels as student's progress through their degree.

This is consistent with literature that describes empathy decline through the progression of a health degree in physicians (Hojat, 2004, Hojat, 2009, Chen, 2007, Michalec, 2010, Hojat et al., 2013a), dentists (Sherman and Cramer, 2005, Nunes et al., 2011), and nurses (Nunes et al., 2011, Sheehan et al., 2013, Ward, 2012). This empathy decline has been describe as an adaptive response to stressors in the learning environment to reduce personal vulnerability (Michalec, 2010). Other possible explanations include changes in the learning environment throughout a degree including increasing workloads, greater time pressures, competitiveness and increased cynicism and dehumanisation driven by an increase in clinical placements and patient interactions (Hojat, 2009, Boyle et al., 2010, Chen, 2007, Williams et al., 2012). Reasons as to why the students in this cohort have displayed only minimal empathy decline may include the adaption of early clinical placements to increase awareness of patients combined with recurrent empathy studies within this particular institution.

With this in mind however, a reduction in empathy amongst paramedics and paramedic students may not necessarily be a negative thing. Grevin speculates that lower empathy amongst paramedics may be an adaptive mechanism that allows paramedics to perform their duties more effectively without risk of personal involvement when surrounded by the suffering of others. Whilst other health professionals show similar declines in patient empathy, this is particularly prominent in paramedics due to the increased environmental stressors involved in their work. Paramedics typically experience higher rates of occupational stress when compared to hospital-based health professionals; the result of an inherent responsibility for others, chronic exposure to human tragedy and frequent dealings with life and death emergencies (Hammer, 1986). Coupled with the frequency of working in uncontrolled and potentially dangerous environments (Linwood, 2007), failure to find appropriate adaptive mechanisms to combat these stressors, such as reduced displays of empathy, typically result in

paramedics displacing their negative attitudes onto patients (Grevin, 1996). In this 1996 study, both student paramedics and qualified paramedics displayed reduced empathy scores consistent with differing personality traits and not learned coping mechanisms or education (Grevin, 1996). The students currently studying at this institution undergo no personality testing prior to enrolment and if reduced empathy is in fact a beneficial quality, future research may highlight the importance of meeting personality selection criteria in selecting student paramedics and any correlation and prediction in empathetic behaviours, job performance and career satisfaction.

There are numerous limitations that may have influenced the results found in this study. Convenience sampling may not have been an accurate representation of the student demographics currently enrolled in the course. However, the expected distribution of females/males and the non-significant difference in number of surveys completed each year minimises this chance. Furthermore, the self-reporting JSE-HPS may not accurately portray how students will behave in both real and simulated clinical situations. Data from this study was unmatched and collected from only a single institution employing an individualised educational program, which may not be a true representation of paramedic students as a whole. A larger study across multiple paramedic institutions building upon already established research would prove beneficial in the development of future educational practice.

Based upon these results and current literature encouraging a heightening level of empathy amongst medical professionals, it is recommended that targeted empathy education programs be further utilised within the paramedic curricula. The non-significant decline in empathy within students is encouraging, and further research should focus on how to stall declines in empathy as students progress through their healthcare degree. Earlier exposure to patients, as well as engaging empathy studies may be beneficial in promoting empathetic behaviour, however further research is

required to support this. If however lower empathy trends are a beneficial predisposed trait amongst paramedics as some research suggests, concurrent studies into how lower empathy impacts paramedic work satisfaction and emotional wellbeing may prove useful.

### Conclusion

The results of this study suggest that undergraduate paramedic students typically display lower empathy than fellow students completed other healthcare professional studies, particularly during the 2008 study cohort. Similar to other healthcare students, female students typically displayed higher empathy than their male counterpart. Unlike previous empathy studies investigating empathy trends amongst paramedic students however, this research found no significant decline as the students progressed through their degree. Whilst it is unclear whether lower empathy trends amongst paramedics are beneficial in coping with and working effectively in the high stress out-of-hospital environment, the current evidence suggests that higher empathy levels are ultimately better for improving both levels of care and patient satisfaction. The means as to how the institution in this study have prevented significant empathy decline throughout the course requires further research, with data collected being used to further promote and build upon current empathy education models amongst student paramedics.

### References

- Baron-Cohen, S. 2004. *The Essential Difference : Male And Female Brains And The Truth About Autism*, New York, NY, Basic Books.
- Boyle, M., Williams, B., Brown, T., Molloy, A., Mckenna, L., Molloy, L. & Lewis, B. 2010. Levels Of Empathy In Undergraduate Health Science Students. *The Internet Journal Of Medical Education*, 1.
- Branch, W. T. 2001. Supporting The Moral Development Of Medical Students. *Journal Of General Internal Medicine*, 15, 503-508.
- Brown, T. 2011. Predictors Of Empathy In Health Science Students. *Journal Of Allied Health*, 40, 143.
- Brunero, S. 2010. A Review Of Empathy Education In Nursing. *Nursing Inquiry*, 17, 65-74.
- Chen, D. 2007. A Cross-Sectional Measurement Of Medical Student Empathy. *Journal Of General Internal Medicine*, 22, 1434-1438.
- Dereboy, C., Harlak, H., Gâfâ¼Rel, S., Gemalmaz, A. & Eskin, M. 2005. Teaching Empathy In Medical Education. *Turk Psikiyatri Dergisi*, 16, 83-89.
- Derntl, B., Finkelmeyer, A., Eickhoff, S., Kellermann, T., Falkenberg, D. I., Schneider, F. & Habel, U. 2010. Multidimensional Assessment Of Empathic Abilities: Neural Correlates And Gender Differences. *Psychoneuroendocrinology*, 35, 67-82.
- Dyrbye, L. N. 2012. Distress And Empathy Do Not Drive Changes In Specialty Preference Among Us Medical Students. *Medical Teacher*, 34, 116-122.
- Dziobek, I. 2008. Dissociation Of Cognitive And Emotional Empathy In Adults With Asperger Syndrome Using The Multifaceted Empathy Test (Met). *Journal Of Autism And Developmental Disorders*, 38, 464-473.
- Fields, S. K. 2004. Comparisons Of Nurses And Physicians On An Operational Measure Of Empathy. *Evaluation & The Health Professions*, 27, 80.
- Fields, S. K. 2011. Measuring Empathy In Healthcare Profession Students Using The Jefferson Scale Of Physician Empathy: Health Provider-Student Version. *Journal Of Interprofessional Care*, 25, 287-293.
- Grevin, F. 1996. Posttraumatic Stress Disorder, Ego Defense Mechanisms, And Empathy Among Urban Paramedics. *Psychological Reports*, 79, 483-495.
- Hammer, J. S. 1986. Occupational Stress Within The Paramedic Profession: An Initial Report Of Stress Levels Compared To Hospital Employees. *Annals Of Emergency Medicine*, 15, 536-539.
- Han, S., Fan, Y. & Mao, L. 2008. Gender Difference In Empathy For Pain: An Electrophysiological Investigation. *Brain Research*, 1196, 85-93.
- Harlak, H., Gemalmaz, A., Gurel, F., Dereboy, C. & Ertekin, K. 2008. Communication Skills Training: Effects On Attitudes Toward Communication Skills And Empathic Tendency. *Education For Health*, 21, 1-6.
- Hemmerdinger, J. M. 2007. A Systematic Review Of Tests Of Empathy In Medicine. *BMC Medical Education*, 7, 24.
- Hojat, M. 2001. The Jefferson Scale Of Physician Empathy: Development And Preliminary Psychometric Data. *Educational And Psychological Measurement*, 61, 349-365.

- Hojat, M. 2002. Empathy In Medical Students As Related To Academic Performance, Clinical Competence And Gender. *Medical Education*, 36, 522-527.
- Hojat, M. 2003. Physician Empathy In Medical Education And Practice: Experience With The Jefferson Scale Of Physician Empathy. *Seminars In Integrative Medicine*, 1, 25-41.
- Hojat, M. 2004. An Empirical Study Of Decline In Empathy In Medical School. *Medical Education*, 38, 934-941.
- Hojat, M. 2005. Empathy Scores In Medical School And Ratings Of Empathic Behavior In Residency Training 3 Years Later. *The Journal Of Social Psychology*, 145, 663-672.
- Hojat, M. 2007. *Empathy In Patient Care : Antecedents, Development, Measurement, And Outcomes*, New York, NY, Springer.
- Hojat, M. 2009. The Devil Is In The Third Year: A Longitudinal Study Of Erosion Of Empathy In Medical School. *Academic Medicine*, 84, 1182-1191.
- Hojat, M. 2011. Physicians' Empathy And Clinical Outcomes For Diabetic Patients. *Academic Medicine*, 86, 359-364.
- Hojat, M., Axelrod, D., Spandorfer, J. & Mangione, S. 2013a. Enhancing And Sustaining Empathy In Medical Students. *Medical Teacher*, 35, 996-1001.
- Hojat, M., Erdmann, J. & Gonnella, J. 2013b. Personality Assessments And Outcomes In Medical Education And The Practice Of Medicine: A mee Guide No. 79. *Medical Teacher*, 35, 1267-301.
- Hojat, M., Gonnella, J. S., Nasca, T. J., Fields, S. K., Cicchetti, A., Lo Scalzo, A., Taroni, F., Vincenza Amicosante, A. M., Macinati, M. & Tangucci, M. 2002. Comparisons Of American, Israeli, Italian And Mexican Physicians And Nurses On The Total And Factor Scores Of The Jefferson Scale Of Attitudes Toward Physician-Nurse Collaborative Relationships. *International Journal of Nursing Studies*, 40, 427-435.
- Kataoka, H. U. 2009. Measurement Of Empathy Among Japanese Medical Students: Psychometrics And Score Differences By Gender And Level Of Medical Education. *Academic Medicine*, 84, 1192-1197.
- Kelleher, S. 2009. A Descriptive Study On Emergency Department Doctors' And Nurses' Knowledge And Attitudes Concerning Substance Use And Substance Users. *International Emergency Nursing*, 17, 3-14.
- Kliszcz, J., Nowicka-Sauer, K., Trzeciak, B., Nowak, P. & Sadowska, A. 2006. Empathy In Health Care Providers-Validation Study Of The Polish Version Of The Jefferson Scale Of Empathy. *Advances In Medical Sciences*, 51, 219-225.
- Konrath, S. H. 2011. Changes In Dispositional Empathy In American College Students Over Time: A Meta-Analysis. *Personality And Social Psychology Review*, 15, 180-198.
- Linwood, R. 2007. Quality Improvement And Paramedic Care: What Does The Literature Reveal For Pre-Hospital Emergency Care In Australia? *International Journal Of Health Care Quality Assurance*, 20, 405-415.
- Looi, J. C. L. 2008. Empathy And Competence. *Medical Journal Of Australia*, 188, 414-416.
- Magalhães, E. 2011. Empathy In Senior Year And First Year Medical Students: A Cross-Sectional Study. *BMC Medical Education*, 11, 52.
- McKenna, L. 2012. Levels Of Empathy In Undergraduate Nursing Students. *International Journal Of Nursing Practice*, 18, 246-251.
- Michalec, B. 2010. An Assessment Of Medical School Stressors On Preclinical Students' Levels Of Clinical Empathy. *Current Psychology*, 29, 210-221.
- Nordby, H. & Nøhr, Ø. 2008. Communication And Empathy In An Emergency Setting Involving Persons In Crisis. *Scandinavian Journal Of Trauma, Resuscitation And Emergency Medicine*, 16, 5.
- Nunes, P., Williams, S., Sa, B. & Stevenson, K. 2011. A Study Of Empathy Decline In Students From Five Health Disciplines During Their First Year Of Training. *International Journal Of Medical Education*, 2, 12-17.
- Regehr, C., Gerald, G. & Judy, H. 2002. Exposure To Human Tragedy, Empathy And Trauma In Ambulance Paramedics. *American Journal Of Orthopsychiatry*, 72., 505-513.
- Sheehan, C., Perrin, K., Potter, M., Kazanowski, M. & Bennett, L. 2013. Engendering Empathy In Baccalaureate Nursing Students. *International Journal Of Caring Sciences*, 6, 456-464.
- Sherman, J. & Cramer, A. 2005. Measurement Of Changes In Empathy During Dental School. *Journal Of Dental Education*, 69, 338-345.
- Singh, S. 2005. Empathy: Lost Or Found In Medical Education? *MedGenMed*, 7, 74.
- Wahlin, U. 1995. Loving Care In The Ambulance Service. *Intensive And Critical Care Nursing*, 11, 306-313.

- Ward, J., Cody, J., Schaal, M., Hojat, M 2012. The Empathy Enigma: An Empirical Study Of Decline In Empathy Among Undergraduate Nursing Students. *Journal Of Professional Nursing*, 28, 34-40.
- Williams, B., Boyle, M., Brightwell, R., Devenish, S., Hartley, P., McCall, M., McMullen, P., Munro, G., O'meara, P. & Webb, V. 2012. Paramedic Empathy Levels: Results From Seven Australian Universities. *International Journal Of Emergency Services*, 1, 2.
- Williams, B., Boyle, M., Brightwell, R., Devenish, S., Hartley, P., McCall, M., McMullen, P., Munro, G., O'meara, P. & Webb, V. 2011. An Assessment Of Undergraduate Paramedic Students' Empathy Levels. *International Journal Medical Education*, 3, 98-102.
- Williams, B., Boyle, M. & Earl, T. 2013. Cross Sectional Measurement Of Empathy Levels In Undergraduate Paramedic Students. *Prehospital And Disaster Medicine*, 28, 145-149.
- Williams, B., Brown, T., McKenna, L., Boyle, M., Palermo, C., Nestel, D., , Brightwell, R., McCall, L., & Russo, V. 2014. Empathy Levels Among Health Professional Students: A Cross-Sectional Study At Two Universities In Australia. *Advances In Medical Education And Practice*, 5, 107-113.
- Yu, J. 2009. Evaluation Of Empathy Measurement Tools In Nursing: Systematic Review. *Journal Of Advanced Nursing*, 65, 1790-1806.
- Ziółkowska-Rudowicz, E. & Kładna, A. 2010. Empathy-Building Of Physicians. Part I--A Review Of Applied Methods. *Polski Merkurusz Lekarski: Organ Polskiego Towarzystwa Lekarskiego*, 29, 277-281.