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Perceived leadership quality and empathy among Indian undergraduate medical students

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Abstract:

BACKGROUND: Efficient leaders from the medical fraternity may understand healthcare in depth. Empathy is important for patient care, job satisfaction, and the psychological well-being of doctors. Empathic leadership is concerned with an interest in the people around them. This study aimed to observe the perceived leadership quality and empathy among Indian medical undergraduate students, find any correlation between them, and assess age, sex, and semester of study as predictor variables for leadership and empathy.

MATERIALS AND METHODS: An online cross-sectional survey was conducted on Google Forms with undergraduate medical students in India with a convenient snowball sample. The Abbreviated Self Leadership Quality (ASQL) was used to find the leadership quality and the eight-item Empathy Quotient (EQ-8) to find the empathy. Spearman's correlation coefficient was calculated between ASQL and EQ-8 score. Age, sex, and semester were used as predictor variables in regression analysis with leadership and empathy as dependent variables.

RESULT: A total of 439 (50.8% male, 49.2% female) Indian undergraduate students participated in the study. Males showed higher leadership qualities. There was no gender difference in empathy. Leadership was positively correlated (r_s =0.13, P = .006) with empathy in the overall sample. The age (P = .001), sex (P < .0001), and semester of study (P < .0001) successfully predicts leadership (F = 57.167, P < .0001). Although age, sex, and semester combined successfully predict empathy (F = 5.31, P = .001), individually, only a semester of study (P = .009) significantly contributes to the prediction.

CONCLUSION: Male and female medical students show a similar level of empathy but male shows higher leadership quality. Leadership and empathy are positively correlated; hence, students with higher leadership quality would show higher empathy and vice versa. The age, sex, and semester of study are determinants of leadership whereas semester of study is the determinant of empathy.

Keywords:

Empathy, India, leadership, medical students, patient care, semester

Introduction

The term "leadership" although concerned with "leading a group of people or an organization," encompasses a wide array of functionalities and capabilities of a person to lead, manage, and progress.[1] In the healthcare system, excellent medical care cannot be delivered with only medical knowledge. Doctors' responsibilities are extended beyond clinical treatment. They should be efficient to lead a team in the patient-care setting and within the broader framework of healthcare systems. In addition, doctors must possess the required abilities for cooperation and collaboration with other healthcare professionals.[2] Tomorrow's healthcare system would be led by today's medical students. However,

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despite continuously growing healthcare delivery, the need for efficient leaders is rarely considered. Medical students in India are rarely taught about leadership in the current undergraduate and postgraduate medical curricula.[3] According to the new competency-based medical curriculum, an Indian medical graduate should have the skills necessary to be a clinician and a leader with an emphasis on professionalism, ethics, and empathy.[4]

Empathy is the capability of a person to perceive and share the feeling of others. Hence, empathy is one of the qualities that help build a good doctor-patient relationship that helps in better patient care.[5] Empathy helps in building healthy interpersonal and corporate cultures. All three domains – cognitive, emotional, and behavioral empathy – would help a leader be concerned with the team and the people he is working with.[6,7] Several previous studies have reported the difference in empathy according to gender, semester of study, and choice of sub-stream of medicine among medical and allied health students with diverse results from different countries.[8-13] However, no previous study has ascertained the relationship between empathy and leadership among Indian medical students.

In this context, this study aimed to observe the level of perceived leadership quality and empathy among medical students according to gender and semester of study and find if any correlation exists between perceived leadership quality and empathy.

Materials and Methods

Study design and setting

This was a cross-sectional study conducted with Indian undergraduate medical students of all semesters. We used a free online survey platform – Google forms to conduct the survey. The survey questionnaire was shared to disperse it to the potential candidates in all Indian states.

Study participants and sampling

The total of undergraduate medical seats in India per year is 91977. Taking a total of 4.5 years of study, the total number of students would be 459885. Taking this population, a 95% confidence level, and a 5% margin of error, the minimum sample size was 384 (calculated from: https://www.calculator.net/sample-size-calculator.html). However, we tried to recruit more numbers according to our capability.

The survey link was shared on social media messengers like WhatsApp, Facebook, and Telegram with personal contacts (convenient sampling) of the authors and colleagues with a request for participation. The respondents were requested to spread the survey links with medical students (snowball type of sampling). The inclusion criteria were also written in brief in the message that only undergraduate medical students (only modern medicine - MBBS) in any medical college in India were invited to participate. There was no exclusion criterion. All the questions in the survey were made compulsory; hence, no response was incomplete.

Data collection tool and technique

The informed consent posted at the beginning of the survey page mentions that the survey is voluntary and the participants have the full right to not participate in the study, even when in the middle of filling up the responses. In addition, an email address was also provided for a copy of the informed consent or any queries. The informed consent text was followed by a button "I agree to participate." And the answer to the question was made compulsory. Hence, any respondent who does not click on the button would not be taken to the survey proper.

The leadership in students was assessed by the Abbreviated Self-Leadership Questionnaire (ASLQ).[14] This questionnaire contains a total of 9 items that collect data on the self-goal setting, self-observation, visualizing performance, visualizing successful performance, self-reward, evaluating beliefs and assumptions, and self-talk domains. The response option ranges from "not at all accurate" (=1) to "completely accurate" (=5) on a 5-point Likert-type scale. All the questions were direct; hence, no reverse coding was required. The questionnaire is available in Annexure I.

The empathy was assessed by the eight-item version of the Empathy Quotient (EQ-8).[15] This questionnaire contains a total of 8 items that collect data on a 5-point Likert-type response option ranging from "strongly disagree" (=1 in forward coding; =5 in reverse coding) to "strongly agree" (=5 in forward coding; =1 in reverse coding). Four statements required forward coding and four statements required reverse coding. The questionnaire is available in Annexure II.

Both questionnaires were previously used on Indian medical students and were reported to have sufficient internal consistency.[16,17] Hence, both questionnaires were deemed to be administrable among Indian medical students. However, for an additional analysis, after collecting data, we determined the Cronbach's alpha from the responses we obtained.

Ethical consideration

The study was conducted after taking permission from the Institutional Ethics Committee. The study was

conducted following the WMA Declaration of Helsinki, updated in 2013.

Statistical Analysis

The survey data was collected from Google Forms as a spreadsheet. The response was in textual form. It was coded in numerical values according to the nature of forward/reverse coding in Microsoft Excel 2010® with the function "Find and Replace (Ctrl + F)" function of Excel. The data were (total score of leadership or empathy survey) first checked for normality by the Shapiro-Wilk test. The data were not found distributed normally. Hence, all the tests were decided for non-parametric data.[18] As there is no defined level of high, normal, or low score of leadership score or empathy score, we considered the mid-point of the overall score to be a hypothetical median. If the observed median is significantly below or above the median, this would indicate a significantly lower or higher level of leadership or empathy score. We used the one-sample median test for comparing the hypothetical median with the observed median. The comparison between males and females was conducted by the Mann-Whitney U test and the correlation was Spearman's correlation. The data were presented as the median, first quartile (Q1) – third quartile (Q3), and range. The categorical data (Indian zone-wise and semester-wise distribution of sample) were presented as numbers and percentages and compared by the Chi-square test. The linear regression equation was used with independent variables (age, sex, semester of study) to predict the leadership or empathy score in the overall sample, males, and females. Cronbach's alpha was calculated to find the internal consistency of the questionnaire. We fixed Cronbach's alpha >7 to be sufficient for internal consistency.[19] For the entire statistical test, a $P < .05$ was considered statistical significance. We used Microsoft Excel 2010® (Microsoft Inc., USA) and IBM SPSS Statistics 20 (IBM, Chicago, USA) software applications on a personal computer for conducting statistical tests.

Results

A total of 439 [male 223 (50.8%) and female 216 (49.2%)] undergraduate medical students participated in the study. The distribution of the sample in six Indian zones is shown in Figure 1. We have received the highest number of responses from the eastern zone and the least responses were from the northeastern zone; χ^2 (5) =44, $P < .0001$. The distribution of the sample according to the semester of study is shown in Figure 2. The maximum number of students was from the first semester and the minimum number was from the seventh-semester students; χ^2 (8) =379.9, $P < .0001$.

The perceived leadership quality and empathy score and its comparison with a hypothetical median are shown in Table 1. There was a higher leadership quality and empathy overall, among male and female medical students.

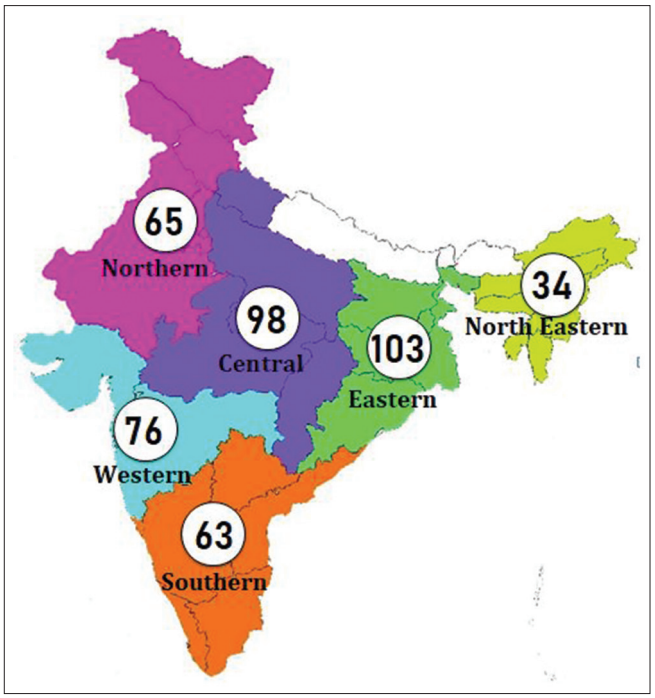

Figure 1: Distribution of sample according to six Indian zones

The gender-wise differences in leadership score and empathy score are shown in Table 2. Male students showed a significantly higher ($P < .0001$) score in perceived leadership quality; however, there was no gender difference in empathy ($P = .25$).

Semester-wise leadership quality score is shown in Figure 3a and the empathy score is in Figure 3b. There was a significant difference (Kruskal–Wallis one-way analysis of variance $P < .0001$) in leadership scores across the semester of study with the following hierarchy according to the median: ninth > eighth > seventh > fifth > sixth > fourth > second > third > first [Figure 3a]. In a *post hoc* analysis, among 36 pair comparisons, 20 pairs showed statistically significant differences between the median. We found a significant difference (Kruskal–Wallis one-way analysis of variance $P = .0012$) in empathy score across the semester of study with the following hierarchy according to the median: fifth > ninth > fourth, sixth > seventh > first, eight > second, third [Figure 3b]. However, in a *post hoc* analysis, among 36 pair comparisons, only 2 pairs (second-fifth and second-ninth) showed statistically significant differences between the median.

The Spearman correlation coefficient between leadership and empathy score is shown in Table 3. In the overall sample, the leadership score was found to be significantly

Table 1: Level of leadership and empathy score in the overall and gender-wise sample

Statistical parameter	Overall (*n*=439)		Male (*n*=223)		Female (*n*=216)	
	Leadership	Empathy	Leadership	Empathy	Leadership	Empathy
Hypothetical median	22.5	20	22.5	20	22.5	20
Actual median	36	25	37	26	36	25
Discrepancy	–13.5	–5	–14.5	–6	–13.5	–5
P	<0.0001*	<0.0001*	<0.0001*	<0.0001*	<0.0001*	<0.0001*

*Statistically significant *P* value of the one-sample median test. The leadership and empathy scores were calculated by taking the sum of the Likert-type scale response (ranging from 1 to 5) for 9 items and 8 items, respectively. A hypothetical median indicates the middle of the highest possible score – 22.5 ([9×5]/2) and 20 ([8×5]/2)

Table 2: Overall and gender-wise leadership and empathy score

Score	Median (Q1–Q3); minimum - maximum			*P*
	Overall (*n*=439)	Male (*n*=223)	Female (*n*=216)	
Leadership	36 (34–39); 9–45	37 (34–39); 21–45	36 (32–39); 9–45	<0.0001*
Empathy	25 (23–29); 12–40	26 (22–29); 12–40	25 (24–29); 19–37	0.25

*Statistically significant *P* value of Mann-Whitney *U* test. Leadership and empathy scores were calculated by taking the sum of Likert-type scale responses (ranging from 1 to 5) for 9 items (i.e., question/statement), and 8 items, respectively

Table 3: Overall and gender-wise correlation between leadership and empathy score

Statistics	Overall	Male	Female
r_s	0.13	0.36	–0.09
95% Confidence interval	0.035 to 0.225	0.236 to 0.472	–0.236 to 0.047
P	0.006*	<0.0001*	0.182

*Statistically significant *P* value of Spearman's correlation coefficient (r_s)

positively correlated ($r_s = 0.13$, $P = .006$) with the empathy score and vice versa (two-tailed *P*). Male students showed a positive correlation ($r_s = 0.36$, $P < .0001$). However, female students did not show any significant correlation.

Gender-wise and overall sample regression analysis with leadership as a dependent variable and age, sex, and semester of study as predictor variables are shown in Table 4. In the overall sample, the age, sex, and semester of the study were successfully predicting the leadership score, ANOVA F (3, 435) = 57.167, $P < .0001$. Individually, all three predictor variables statistically significantly contributed to the prediction. When gender-wise regression analysis was conducted, in both genders, the age and semester significantly contributed to the prediction.

Regression analysis of empathy score as the dependent variable and age, sex, and semester of study as predictor variables in the overall and gender-wise sample are shown in Table 5. In the overall sample, the model successfully predicts the empathy score, ANOVA F (3, 435) = 5.31, $P = .001$. However, individually, only the semester of study significantly contributed to the prediction ($P = .009$). A similar result was observed for male students. However, in females, the model could not predict the outcome from age and semester of study.

As the questionnaire was previously used in limited number of studies in India, we additionally tested the questionnaire for its internal consistency. For the ASLQ, the Cronbach's alpha was 88. For the EQ-8, the Cronbach's alpha was 74. This indicates that the questionnaire is having a sufficient level of internal consistency.

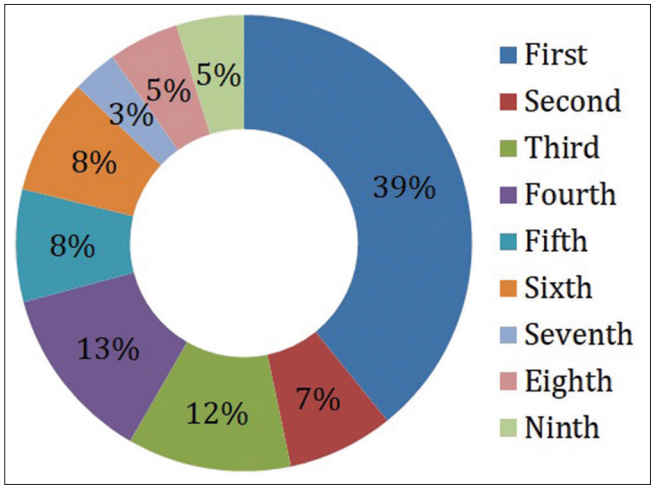

Figure 2: Participants according to the semester of study

Discussion

To find the level of perceived leadership quality and empathy among Indian medical students, we found that the perceived leadership quality and empathy are above the average level. This indicates that the Indian medical students are having a good level of leadership quality and empathy. However, comparatively, the perceived leadership quality was higher than the empathy. Although the debate would continue if the leadership is an inherent or achievable quality, the effect of training would make the students interested and learn the quality of a leader which would rarely be known to them. Leaders become great leaders with experiences gained during the course of their leadership.

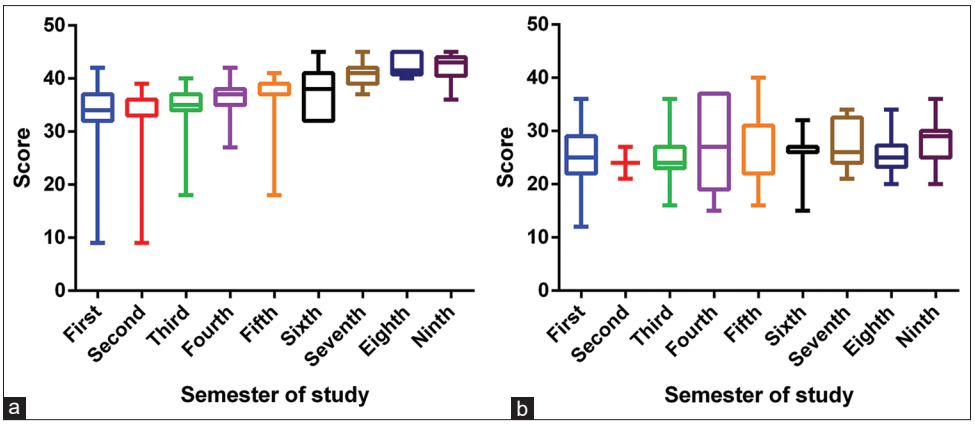

Figure 3: Semester-wise (a) leadership score and (b) empathy score in box plots

Table 4: Linear regression to predict leadership score from sex, age, and semester

	Overall	Male	Female
r	0.532	0.707	0.476
r^2	0.283	0.5	0.227
Adjusted r^2	0.278	0.496	0.22
F	57.167	110.135	31.28
df1	3	2	2
df2	435	220	213
P	<0.0001*	<0.0001*	<0.0001*
P_{age}	0.001*	0.008*	<0.0001*
$P_{semester}$	<0.0001*	<0.0001*	<0.0001*
P_{sex}	<0.0001*	-	-

*Significant *P* value. A significant *P* value indicates that overall, age, sex, and semester (independent variable) can predict successfully the leadership score (dependent variable). A significant P_{age}, $P_{semester}$, and P_{sex} indicate that individually the age, semester, and sex contribute significantly to the prediction

Table 5: Linear regression to predict empathy score from age and semester

	Overall	Male	Female
r	0.188	0.267	0.046
r^2	0.035	0.071	0.002
Adjusted r^2	0.029	0.063	-0.007
F	5.31	8.426	0.227
df1	3	2	2
df2	435	220	213
P	0.001*	<.0001*	0.797
P_{age}	0.171	0.08	0.911
$P_{semester}$	0.009*	0.033*	0.502
P_{sex}	0.099	-	-

*Significant *P* value. A significant *P* value indicates that overall, the age, sex, and semester (independent variable) can predict successfully the leadership score (dependent variable). A significant P_{age}, $P_{semester}$, and P_{sex} indicate that individually the age, semester, and sex contribute significantly to the prediction

Like all professionals, medical students should be aware of the issues surrounding and affecting their core competencies.[20] It is found that empathy helps in organizing and delivering healthcare services effectively to society. However, medical professionals in India may face challenges to practice those in the current healthcare system due to a high number of patients, lack of time, inadequate infrastructure, higher working hours, etc.[6] From the result about the correlation between leadership and empathy, it is obvious that medical students are having the characteristics to lead the system empathically. However, it may be high time to strengthen the curriculum to reinforce leadership and empathy training.

When the leadership quality was compared according to gender, we found that male medical students have higher perceived leadership quality. This is in support of a classical male-dominance in leadership. Gender inequality in leadership is observed from historical time to date in political, social, educational, and research organizations.[21,22] Several factors may be playing a role in this inequality. However, the inherent perception of leadership between males and females may be one of the factors. It has been reported that male leaders perceive the leadership to be their destiny. They would choose to lead to gain influence and are encouraged to advance in leadership by senior male leaders. In contrast, female leaders believe that they are being prepared for leadership for a long time. They would make a difference in the organization and relies on their initiatives to rise to organizational progress.[23]

Compared variance among different semesters of study, we found that the increment in the study time in a medical institution, overall, determines the leadership quality with a positive correlation. This may be due to the higher exposure of the students to the healthcare management system in an organized institution while studying the clinical subjects. This further indicates the potential of a training program with exposure to healthcare management for building a future pool of leaders.[24]

In a traditional model of healthcare leadership, a senior faculty member with a good academic record is chosen for leading the system. Hence, presumably, age and experience are playing a role in choosing a leader.[25] In

our study, we found that higher age may be a determining factor with a positive correlation. However, empathy did not show such a relation with age. Hence, leadership and empathy although they are positively correlated, may have different sets of determining factors. However, in this study, we only explored age, time spent, and sex as predicting factors. In any future study, other predictor variables like family history, socioeconomic background, previous exposure to leadership, etc., may be explored.

We found a similar level of empathy in male and female medical students. This finding is similar to another study conducted by Mishra *et al*. with the same questionnaire conducted with medical students in the eastern part of India.[17] However, this finding is not supported by the much-explored finding about the effect of gender on empathy with females having higher empathy.[26] It has been proposed that in addition to the influence of socialization, phylogeny and ontogenetic factors also contribute to gender disparities in empathy.[27] However, it has also been reported that contextual variables may affect the level of empathy and have the potential to be biased by gender roles and stereotypical beliefs and the gender difference is too narrow to map.[28] Even affective and cognitive empathy may not show any gender difference in a different set of experiments.[29] The self-report type of empathy assessment may have social desirability bias.[30] Hence, our findings of the current study may be attributed to the self-report type of assessment, the difference in socialization, cultural influence, or any other unexplored trait. Further studies with a larger sample would enlighten on this topic in the future.

Limitation and recommendation

This study has several limitations. The sample of the study is unequally distributed in different semesters of the study. Although we have achieved the minimally required sample, a higher sample size would increase the power of the study. However, this was not possible due to the limitation of the snowball sampling. Further multicentric studies may be conducted with a random sampling method to get more generalized results that can be extended to the student population. In addition, equally distributed students from various semesters should be used.

Conclusion

Empathy in male and female medical students is similar but the perceived leadership quality is higher among male students. An increase in empathy score increases leadership quality and vice versa. However, this correlation was not seen among female students when analyzed separately. Age, sex, and semester of study are the determining factors for leadership quality among males and females. However, although age, sex, and semester can predict empathy among overall students, the semester of study can predict empathy among male students only. The regression model was not successfully applicable to female students. The questionnaire ASQL and EQ-8 showed an excellent and minimally acceptable level of internal consistency, respectively. Hence, these questionnaires may be used by Indian medical students in any future research.

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Nil.

Conflicts of Interest

There are no conflicts of interest.

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Annexure I: Abbreviated self-leadership questionnaire (ASLQ)

Items	Response option				
	Not at all accurate	Somewhat accurate	A little accurate	Mostly accurate	Completely accurate
I establish specific goals for my own performance	O	O	O	O	O
I make a point to keep track of how well I'm doing at work	O	O	O	O	O
I work toward specific goals I have set for myself	O	O	O	O	O
I visualize myself successfully performing a task before I do it	O	O	O	O	O
Sometimes I picture in my mind a successful performance before I actually do a task	O	O	O	O	O
When I have successfully completed a task, I often reward myself with something I like	O	O	O	O	O
Sometimes I talk to myself (out loud or in my head) to work through difficult situations	O	O	O	O	O
I try to mentally evaluate the accuracy of my own beliefs about situations I am having problems with	O	O	O	O	O
I think about my own beliefs and assumptions whenever I encounter a difficult situation	O	O	O	O	O

Coding: Strongly disagree=1, Disagree=2, Neither disagree nor agree=3, Agree=4, and Strongly agree=5. This questionnaire was developed by Houghton JD, Dawley D, and DiLiello TC; published in 2012 and available from the Regent University repository from the following link: https://www.regent.edu/acad/global/publications/ijls/new/vol7iss2/IJLS_Vol7Iss2_Houghton_pp216-232.pdf

Annexure II: Eight-item version of the empathy quotient (EQ-8)

Items	Response option				
	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I find it easy to put myself in somebody else's shoes	O	O	O	O	O
I am good at predicting how someone will feel	O	O	O	O	O
I am quick to spot when someone in a group is feeling awkward or uncomfortable	O	O	O	O	O
Other people tell me I am good at understanding how they are feeling and what they are thinking	O	O	O	O	O
I find it hard to know what to do in a social situation*	O	O	O	O	O
I often find it hard to judge if something is rude or polite*	O	O	O	O	O
It is hard for me to see why some things upset people so much*	O	O	O	O	O
Other people often say that I am insensitive, though I don't always see why*	O	O	O	O	O

Coding: Strongly disagree=1, Disagree=2, Neither disagree nor agree=3, Agree=4, and Strongly agree=5. *Reverse coding: Strongly disagree=5, Disagree=4, Neither disagree nor agree=3, Agree=2, and Strongly agree=1. This questionnaire was developed by Loewen PJ, Lyle G, and Nachshen JS; published in 2008 and available from the Toronto University repository from the following link: http://individual.utoronto.ca/loewen/Research_files/Eight%20Question%20ES_final.pdf