# New trend of authentic leadership skills in nursing education: The key role of perfectionism and self-efficacy

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Research article

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# Abstract

Background: In the literature the need to shape leadership skills in nursing in the process of education is stressed. In order for it to be effective, actions need to be undertaken including some personality traits which may frequently be observed in students of nursing (e.g. perfectionism and self-efficacy). The role of personality traits in acquiring leadership skills is not recognized well. The aim of the study was determining whether perfectionism may be treated as a mediator between the feeling of one's own efficacy, and authentic leadership skills in students of nursing.

Methods: The group of people studied consisted of 615 students of nursing (Women = 96.3%, n=592; Men = 3.7%, n=23), who made up 67.51 % all students of the discipline. The following research tools were used: Authentic Leadership Questionnaire, Almost Perfect Scale-Revised (APS-R), and General Self-Efficacy Scale (GSES).

Results: The level of perfectionism is a significant mediator of relations between self-efficacy (GSES) and the level of authentic leadership (Sobel Test: t = 6.958; p = 0.000). The relation, without a mediating factor, is positive, and standardized beta coefficient for the feeling of own efficacy totals beta = 0.470 (p = 0.000), while in the presence of a mediator the strength of the correlation is smaller and amounts to beta = 0.366 (p = 0.000).

Conclusions: Taking into account personal variables (perfectionism and self-efficacy) in the process of shaping skills is of key importance. In order to increase the efficacy, the programs of teaching these skills should include mutual relation between perfectionism and self-efficacy.

# Background

Leadership skills are broadly discussed in the literature on nursing (1-5). Not only the variety of types of leadership shows it, but also the number of studies published in this area (6). However, authentic leadership (AL) deserves special attention (7-9). AL skills may bear great significance in clinical work (5). It is connected not only with work organization, but may condition proper relations in a team. Clinical work demands team work which entails cooperation with numerous specialists (3, 9-11). Proper and authentic relations in work environment influence the quality of work (e.g. patient safety) (12), the nurses' well-being (13, 14), and prevent burnout. In this regard, introducing efficient teaching of leadership skills for nurses before their commencement of professional work is crucial. However, diagnosis of these skills remains problematic. In the literature there is still lack of research which would analyse the problem of diagnosis and reinforcement of leadership skills in nurses before their commencement of clinical work, and thus among students of nursing It needs to be stressed that leadership skills are not constant and analyzed as personality traits, as they may undergo modification (8, 9). In this regard, acquiring and improving leadership skills must not be introduced too late (e.g. as a postgraduate course). Not only determining the degree of the skills, but also methods of their consolidation, remains fundamental. According to Panczyk et al. (15) enabling nurses executing auto diagnosis of their own skills may be

relevant. Self-assessment fulfils a very important role in developing the skills of self-perception, which increases the motivation of an individual to further action. In this regard, Authentic Leadership Self-Assessment Questionnaire was developed. It is worth noting that apart from this questionnaire, in the literature there are two other tools for measuring authentic leadership – the Authentic Leadership Questionnaire (ALQ) and Authentic Leadership Self -Assessment Questionnaire (ALSAQ). Both questionnaires were developed by Walumbwa et al., (9) but the ALQ was initially designed to confirm theoretical assumptions of the authentic leadership concept. ALSAQ is recommended by Northouse (16) for practical use to perform self-assessment. ALSAQ for the nurses was based upon them (15).

Authentic leadership skills may be directly shaped by modelling an authentic attitude, but also through psychological variables which influence human behaviors. One such variable may be self-efficacy (17). This is the belief that one can perform novel or difficult tasks, or cope with adversity – in various domains of human functioning (18). The construct self-efficacy is broadly discussed in the literature as a psychological variable conditioning not only undertaking various behaviors, but it also determines the likelihood of execution of the measures and their multiplication (19). The relation between self-efficacy and leadership skills is also stressed in the literature on professionally active nurses (15, 17). There is, however, lack of studies analyzing the relation among students of nursing. By analogy, it can be assumed that it is a similar relation.

There are also no studies which would analyze the role of perfectionism in shaping leadership skills as well as the relation between self-efficacy and perfectionism in the context of improving these skills. Perfectionism is a personality trait hard to define clearly, as it has two subdimensions. First of them may hamper proper functioning of an individual. For instance, a person may focus on details of an undertaken activity too much, which totally paralyzes its execution. Such a situation is called maladaptive perfectionism. The second dimension – adaptive perfectionism – should help perform activities properly and meticulously (20).

*Aim of study*

The aim of the study was determining whether perfectionism can be treated as a mediator between self-efficacy, and authentic leadership skills in students of nursing. Determining whether perfectionism as a mediator may enhance or weaken the relation between self-efficacy and leadership skills was crucial.

# Methods

*Material*

The group of respondents consisted of 615 students of nursing. The criteria for inclusion in the study were: 1) the status of a student of nursing at Medical University of Warsaw (MUW), 2) informed consent to participate in the study. The criteria for exclusion in the study were: 1) the status of a student of a discipline other than nursing at MUW, 2) lack of informed consent to participate in the study. Students of all years at the discipline nursing were included in the study. B.A. Students (n=353) and M.A. Students

(n=262) participated in the study. Among B.A. students, 169 were 1st year students, 134 2nd year students and 50 3rd year students. In the case of M.A. students, 129 were 1st year students, and 133 2nd year students. In the academic year 2017/2018 911 students studied nursing, out of which 549 B.A. students, and 362 M.A. students. The ratio of filled in questionnaires from B.A. students was 64.30 %. In the case of M.A. students, the ratio was 72.38 %.

Average age of the respondents was 24.26 years (SD=4.721). The youngest student of nursing was 20 the oldest 53. Women prevailed in the analyzed group (96.3%; n=592). Men constituted 3.7% of all respondents (n=23). Students from very large cities dominated in the study (n=243; 39.5%) and villages (n=183; 29.8%). Further there were students from small towns (n=98; 15.9%) and medium size towns (n=66; 10.7%). The smallest share of students came from large cities (n=25; 4.1%).

*The context of the character of nursing education in Poland*

Education of nurses in Poland takes place in accordance with norms determined by the EU Directive (21) and the Regulation of the Minister of Science and Higher Education (22). In light of the abovementioned legal regulations, nurses in in Poland are educated according to a split level approach. First-degree studies have a practical profile and last no shorter than 6 semesters, and second-degree studies have a more general profile, include elements of pedagogy, management and methodology of research and last no less than 4 semesters. After first-degree studies and passing a vocational exam, a student gets the right to exercise their profession and may work as a nurse. Second-degree studies are of supplementary character, aiming at increasing their professional competencies and preparing to take management post. A very extensive offer of postgraduate education is an additional form of educating nurses in Poland. Already after graduation a nurse can apply to a specialty training (providing she has a minimum two years of professional experience), qualification degree course (providing she has at least 6 months of professional experience), which is a smaller form of specialty training and training course, aiming at increasing the competences of a nurse (e.g. cardiopulmonary resuscitation (CPR), wound treatment, communication, etc.)(23). Although a graduate of nursing has multiple paths of development, there are too few new nurses in this profession. In light of the data of the Supreme Chamber of Nurses and Midwives, the average age in the profession in 2018 was 52.03, and the number of nurses was 233 012, which approximates one nurse for every 165 Poles (24, 25).

*Methods*

*Theoretical assumptions of the model*

On the basis of data from the literature, a positive relation between self-efficacy and authentic leadership skills can be assumed (15, 17). Taking into account the nature of the variable such as perfectionism (20, 26-28), it may be assumed that it will be a mediator of relations between self-efficacy and leadership skills (Figure 1). Taking into account the complexity of personality such as perfectionism, the dimension which is directly connected with setting high standards to oneself was selected for further analyses. The High Standards taps into having high standards and expectations about one's performance and

achievements (20). Such an attitude may have particular significance for acquiring and improving one's own leadership skills.

## Data collection procedure

Before commencing to the study, essential consents for conducting the cross-sectional study were obtained among students of nursing at the MUW. Next, a person responsible for didactics in nursing (coordinator of nursing) was contacted in order to enable executing an auditorium questionnaire. The coordinator was in charge of the accuracy of conducting the research and was part of the research team. The coordinator was instructed in terms of data collection supervision. The training was conducted by a psychologist. It was connected with the fact that the contents of the research tool concerned the realm of psychological functioning. In this regard the risk of potential influence of outsiders on answering questions by the respondents had to be minimalized. The data was gathered on the premised of the Medical University of Warsaw from October to December 2019. Students filled in the survey at the beginning of their classes in the presence of the coordinator. There were no third parties present during data collection. The students were informed on the aim of the study, as well as on the possibility to deny participation in it. The coordinator assured the students of full anonymity of the studies. The mean time of data collection was 10 minutes. The studies were conducted in two stages. The first stage included B.A. studies, and the second stage M.A. studies. No detailed register of the students who denied participation in the studies was kept. Only the number of students who denied participating in the study was recorded.

## Research tools

The following research tools were used: Authentic Leadership Questionnaire (8), Almost Perfect Scale-Revised (APS-R) (20), and General Self-Efficacy Scale (GSES) (19).

Authentic Leadership Questionnaire (ALQ) is designed to measure the components that comprise Authentic Leadership, and has four scales: Self Awareness, Transparency, Ethical/Moral, and Balanced Processing. The Polish version of ALQ was used which consist of 16 items. The respondent replies to each question using a 5 point scale (Not at all - Once in a while - Sometimes - Fairly often - Frequently, if not always) (8)

Almost Perfect Scale-Revised (APS-R) consists of 23 items, which contains three variables: High Standards, Order, and Discrepancy. Respondents replied to particular questions using a 7-point scale (Strongly Disagree, Disagree, Slightly disagree, Neutral, Agree Slightly, Agree, Strongly Agree). The designers of APS-R (20) consider Standards and Discrepancy as defining elements of perfectionism. High scores in Standards mean high expectations being set with a high need for excellence. This defines perfectionists, whether they are 'maladaptive' or 'adaptive'. A high score on the Discrepancy Scale combined with a high score in Standards is what indicates a maladaptive type of perfectionism.

Maladaptive basically means less flexible to the point of frustration and inability to reach goals or just the continual 'not good enough' (20, 29)

General Self-Efficacy Scale (GSES) is a self-report measure of self-efficacy and consists of 10 items. A respondent replies to each question using a 4-point scale (Not at all true, Hardly true, Moderately true, Exactly true). The total score is calculated by finding the sum of all the items. For the GSE, the total score ranges between 10 and 40, with a higher score indicating more self-efficacy. Cronbach's alpha for GSES is between .76 and .90. (18). In this study, the Polish version of GSES was used (19).

*Consent of the bioethics committee*

The authors of the present study obtained the opinion Institutional ethics Committee of Medical University of Warsaw on no contradictions for conducting studies with the use of non-invasive research methods (30).

*Statistical analysis*

All of the statistical analyses were performed using STATISTICA 13.3 (TIBCO$^©$, Inc., Palo Alto, California, United States) under the MUW licence. *P*-values <0.05 were considered to be statistically significant.

Assessment of prevalence of partial mediation was conducted according to the procedure proposed by Cohen et al. (31). Mediation analysis is made up of three stages, which consists of a series of regression analyses. The parameters of regression function were estimated with the use of the method of least squares. Non-standardised (b) and standardised (β) regression coefficients together with 95% confidence interval were determined.

In the first stage, the influence of own efficacy (GSES: independent variable) on the level of leadership was evaluated (ALQ: dependent variable). In the second stage the influence of the feeling of one's own efficacy (GSES: independent variable) on the level of perfection standard (potential mediator) was assessed. In the third and last stage of the analysis, it was evaluated whether the independent variable (GSES) and mediator (perfection standard) significantly influence the dependent variable (ALQ). It was assumed that the mediation was significant when intermediate relations – of independent variable and the mediator as well as mediator and dependent variable, were statistically significant. In such cases the determining factor was the result of Sobel test, which evaluates whether the product of nonstandardized regression coefficients of both relations was significantly different from zero (32).

# Results

*The profile of respondents in terms of authentic leadership skills and analyzed psychological variables.*

Table 1 presents the profile of students of nursing in terms of authentic leadership skills and subdimensions of the skills, with the classification into type of studies (B.A. vs. M.A. studies). B.A. and M.A. students did not differ when it comes to the intensity of leadership skills (t=-.900; p>.05) and all

analyzed dimensions of perfectionism: perfection standards (t=-1.500; p>.05), perfection other (t=-1.635; p>.05) and perfection discrepancy (t=1.963; p>.05). Differences were noted only in relation to self-efficacy (t=-2.662; p=.008)

Too high results at the STANDARDS scale giving the evidence of perfectionism are the values from 25 to 49 points. In the analyzed group there are 95.6% (n=588) students of nursing with high score on the scale. In the case of 1.8% (n=11) no data was recorded in this scope. In the case of subscale OTHERS, results showing perfectionism are values from 14 to 28 points. In the analyzed group there are 92.8% (n=571) students of nursing with high score on the scale. In the case of 1.0% (n=6) no data was recorded in this scope. In the case of DISCREPANCY subscale, results showing perfectionism are values from 42 to 84 points. In the group analyzed there are 60.8% (n=374) students of nursing with high score on the scale. In the case of 2.4% (n=15) no data was recorded in this scope. Maladaptive perfectionism should be identified in people who feature high scores on the scales STANDARDS and DISCREPANCY. In the studied group of students of nursing, maladaptive perfectionism was noted in 361 students (58.7%). In other words, over half of students of nursing featured maladaptive perfectionism, which may hamper proper functioning and executing undertaken actions.

*Results of mediation analysis*

As no differences were noted between B.A. students and M.A. Students in relation to general aggravation of leadership skills and perfectionism, further analyses were conducted in the whole group of students without any further classification into study type. The only difference was noted in relation to the sense of one's own efficacy, however the effect size was small (Cohen's *d* = 0.22). In this regard, it was decided to analyze the students of nursing together - irrespective of study type - in terms of self-efficacy.

The first of the tested linear regression models describing the influence of the sense of one's own efficacy on authentic leadership skills was statistically significant (F=163.714, P=0.000, SS model =7043.117, MS model =7043.117, $R^2_{adjusted}$ =0.22) and well fitted to the data (Ramsey RESET test, F =0.107, P =0.899). The results of regression analysis demonstrated that the sense of one's own efficacy ($\beta_{std}$ = 0.470, P = 0.000) was the factor positively influencing authentic leadership skills of the examined students of nursing (Table 2). The higher sense of own efficacy, the higher level of authentic leadership. The sense of own efficacy clarifies 22% variability of authentic leadership skills.

The second of the tested linear regression models describing the influence of the sense of own efficacy on perfectionism (dimension connected with high standards) was also statistically significant (F = 91.637, P = 0.000, SS model = 3700.772, MS model = 3700.772, $R^2_{adjusted}$ = 0.13) and well fit to the data (Ramsey RESET test, F =1.272 , P = 0.281). Results of the regression analysis demonstrated that the sense of own efficacy ($\beta_{std}$ = 0.366, P = 0.000) positively influenced authentic leadership skills (Table 3). The higher the sense of own efficacy the higher the level of perfectionism in the dimension of high standards. The sense of one's own efficacy explains 13% variability of the analyzed form of perfectionism.

The mediation analysis has shown that both the sense of one's own efficacy and perfectionism (the dimension of high standards) independently influence the authentic leadership skills of the students. The model was statistically significant (F = 109.960, P = 0.000, SS model = 8755.282, MS model = 4377.641, R2adjusted = 0.28) and well fit to the data (Ramsey RESET test, F =0.288, P = 0.750). It was observed that students with higher level of the sense of one's own efficacy had also a higher level of authentic leadership ($\beta_{stand.}$ = 0.385, P = 0.000). Similarly, students who had higher level of perfectionism (high standards dimension) also had higher level of authentic leadership skills ($\beta_{stand.}$ = 0.251, P = 0.000) (Table 4). The higher the level of one's own efficacy and perfectionism, the higher the level of leadership. The two variables explain 28% variability of authentic leadership skills. The mediation analysis conducted demonstrated the absence of full mediation.

Considering demonstration of the absence of full mediation, testing of significance of partial mediation was performed (Sobel test). The level of perfectionism is a significant mediator of relations between the sense of one's own efficacy (GSES) and the level of authentic leadership (Sobel test: t = 6.958; p = 0.000). The relation, without an intermediary factor, is positive, and standardized regression coefficient for the sense of one's own efficacy is $\beta$ = 0.470 (p = 0.000), while in the presence of a mediator the strength of the relation is smaller and amount to $\beta$ = 0,366 (p = 0,000).

## Discussion

The results suggest that perfectionism may perform an important role as a mediator in relations between self-efficacy, and AL skills in students of nursing. These are important observations in the context of teaching these skills. The number of studies undertaking the topic of perfectionism among students of nursing is limited, and the knowledge in this scope accounts for a substantial research gap. Analyses pertaining perfectionism in students of nursing concern its relation with stress experienced and the methods of coping with it (33), negative mental functioning and the risk of depression(34). In the literature it is stressed that nurses and their workplace colleagues are all susceptible to maladaptive perfectionism (34). Nursing students show a higher incidence of negative perfectionism than the general population. Maladaptive perfectionism interferes with every aspect of an individual's life, and a nurse's career (33). In this regard it is reasonable to undertake work which would help understand the mechanism. Especially that depression-prone perfectionism may be reflected in behaviour such as consistently setting unrealistic goals, ruminating, never feeling satisfied with one's own or others' performance, avoiding evaluation by important others, and declining needed help (34).

Researchers stress the strong relation between self-efficacy, and leadership skills (15, 17). The studies presented also confirmed the relation. It should be noted that it is not enough to be confident and convinced about the effectiveness of one's own actions in relation to the objective set. Perfectionism is also of great importance here, especially adaptive perfectionism. Perfectionism is a multidimensional concept which includes striving for flawlessness and setting high goals (28). Studies evaluating the role of perfectionism in the competences of medical personnel had their beginning in the late 90s of the twentieth century. Then the concept of perfectionism as an important personality trait in the health care

system was stressed (35). Additionally, the society expects its nurses to be flawless and to do their job as good as possible [3]. Research which would undertake the topic of perfectionism among nurses and students of nursing are limited (33). For instance, Kelly and Clark (33) showed that nursing students show a higher incidence of negative perfectionism than the general population. The study presented also demonstrates that the problem of negative perfectionism concerns a large number of students of nursing. This confirms the need to modify and adapt the curricula so that they include programs of supporting students with high negative perfectionism. In the literature it is stressed that academic teachers need to become educated on perfectionism, and then help students at risk by providing resources (33).

There are numerous approaches to perfectionism. However, the discussed variable may be viewed in three important dimensions such as: self-oriented perfectionism, other-oriented perfectionism, and socially-prescribed perfectionism (26). In the context of health care, self-oriented perfectionism may be of high significance. This type of perfectionism is defined as an intrapersonal dimension that involves requiring perfection of oneself, constantly striving to achieve unrealistically high standards, and critically evaluating one's own performance (26). Setting high objectives and, connected with it, standards of conduct, is directly connected with experiencing various emotional conditions. Some people set high standards for themselves, but can also experience positive emotions. These individuals engage in "relaxed and careful" pursuit of activities and evaluate themselves against high but reasonable self-standards. This is the so called healthy and positive form of perfectionism (27). It is believed that such a form of perfectionism should be enhanced as not only does it enable consistent striving for achieving the aim and performing tasks reliably, but it also helps effectively cope with emotions or stress (33). Such a skill may also be particularly important in clinical work. A student who obtains a diploma in nursing should feature not only substantive knowledge, but also psychosocial skills important in clinical work. Patients expect full professionalism from medical personnel, and negative perfectionism may hamper it. For example, perfectionism is a driving force of negative stress in some nurses. Hajloo et al. (36) indicated that perfectionism contributed to job burnout. Some persons with high level of perfectionism may experience mainly negative emotions. Then, such people are profiled as maladaptive, unhealthy, negative form labelled "neurotic". These individuals engage in "tense and deliberate" pursuit of unreasonable expectations (27). The key difference is that adaptive perfectionists derive pleasure from their striving, but maladaptive perfectionists "never seem to do things good enough to warrant that feeling" (27).

The results obtained have important implications in modern education of the nurses that stresses shaping leadership skills and aiming at increasing not only efficacy of clinical work (e.g. patient safety or reducing the number of Medical Errors), but also increasing the number of nurses or their work satisfaction. Curricula of teaching these skills should shape and boost psychosocial skills building not only on modelling some skills (e.g. with the use of mentoring method in a hospital), but also reinforcing personal aptitudes. Such an integrated attitude in education may prove most efficient. Initial diagnosis of such personality traits as perfectionism and self-efficacy may turn especially useful, as they play a key role in acquiring these skills. Such a diagnosis would allow for the choice of an adequate and individual

strategy of teaching, but it also requires a greater elasticity of the teacher (trainer - mentor) in the selection of teaching training methods. In this context an approach based on mentoring may turn out crucial.

*Limitations of the study*

The presented study is not devoid of limitations. In this regard it should be interpreted with great caution. In the first place, the presented study is of cross-sectional nature. This excludes any conclusions concerning the direction of changes in time. It seems justified to undertake longitudinal studies that could help solve this problem. The presented study should be treated as an initial report to design longitudinal studies which will allow for considering the role of perfectionism as the mediator between self-efficacy and authentic leadership skills not only in students, but also among professionally active nurses. Second, in the study a convenient sample, coming from one university only, was applied. This may limit generalising the results to a wider population of students. Another limitation is no possibility of comparison of the obtained results with other studies. In the presented study no additional mediators or moderators, such as e.g. negative thinking or emotional control were considered. Future research should investigate the influence of the variables as potential mediators or moderators.

*Strengths of the study*

Determining the role of perfectionism as the mediator in the relation between self-efficacy and authentic leadership skills is a strength of the study. In the literature there is absence of studies which would undertake the topic not only among students of nursing but also professionally active nurses. Additionally, the obtained research results indicate that psychological variables such as personality traits need to be examined altogether. Personality traits do not function separately, but they may interact. It is especially relevant in relation to shaping psychosocial skills such as, i.a. authentic leadership skills. Another important strength of the study is the group of respondents which comprised students of nursing. The group of analyzed students accounted for 67.51 % all students of nursing studying at the MUW.

# Conclusions

Personality factors play an important role in shaping AL skills. However, they need to be viewed in mutual combination, and not individually. Perfectionism and self-efficacy seem important psychological variables in shaping AL skills. In this regard curricula should include mutual relation between perfectionism and self-efficacy.

# Abbreviations

AL - Authentic leadership

ALQ - Authentic Leadership Questionnaire

ALSAQ - Authentic Leadership Self -Assessment Questionnaire

MUW - Medical University of Warsaw

APS-R - Almost Perfect Scale-Revised (APS-R)

GSES - General Self-Efficacy Scale

# Declarations

*Ethics approval and consent to participate*

The authors of the present study obtained the opinion of MUW  on no contradictions for conducting studies with the use of non-invasive research methods (30). Before the study, the respondent was asked to agree to participate in the study. The research tool was anonymous. There was a special sentence: Your participation in this research is entirely voluntary. It is your choice whether to participate or not. You may change your mind later and stop participating even if you agreed earlier.

*Consent for publication*

Not applicable

*Availability of data and material*

All data generated or analysed during this study are included in this published article

*Competing interests*

The authors declare that they have no competing interests

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*Authors' contributions*

MJ, preparation of the research concept, development and verification of the research model, selection of research tools, analysing  and interpreting the patient data, and was a major contributor in writing the manuscript.

MP, selection of research tools, development and verification of the research model, analysing and interpreting the patient data, and was a contributor in writing the manuscript.

AL, development and verification of the research model, collecting data, preparing database, and was a contributor in writing the manuscript.

AN, development and verification of the research model, collecting data, preparing database, and was a contributor in writing the manuscript.

JG, development and verification of the research model, collecting data, preparing database, and was a contributor in writing the manuscript.

All authors read and approved the final manuscript, and was a contributor in writing the manuscript.

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# Tables

Table 1. The profile of respondents in terms of authentic leadership skills and perfectionism

| Variable | N | Min.-Max. | Average | Standard deviation |
|---|---|---|---|---|
| Authentic leadership skills | | | | |
| **Balanced_Processing** | 605 | 5-15 | 11.85 | 2.065 |
| Bachelor degree studies | 348 | 5-15 | 11.819 | 2.080 |
| Master degree studies | 256 | 6-15 | 11.906 | 2.042 |
| **Self_Awareness** | 610 | 8-20 | 14.89 | 2.377 |
| Bachelor degree studies | 349 | 9-20 | 14.72 | 2.382 |
| Master degree studies | 260 | 8-20 | 15.11 | 2.358 |
| **Transparency** | 609 | 11-25 | 18.83 | 2.858 |
| Bachelor degree studies | 350 | 11-25 | 18.82 | 2.837 |
| Master degree studies | 258 | 12-25 | 18.83 | 2.892 |
| **Moral** | 607 | 9-20 | 16.28 | 2.318 |
| Bachelor degree studies | 351 | 9-20 | 16.23 | 2.297 |
| Master degree studies | 255 | 9-20 | 26.36 | 2.352 |
| **Leadership (Global score)** | 588 | 40-80 | 61.86 | 7.417 |
| Bachelor degree studies | 341 | 40-78 | 61.64 | 7.340 |
| Master degree studies | 247 | 41-80 | 62.16 | 7.520 |
| Perfectionism | | | | |
| Perfection standards | 604 | 7-78 | 38.78 | 6.787 |
| Bachelor degree studies | 342 | 11-78 | 38.42 | 6.680 |
| Master degree studies | 262 | 7-49 | 39.26 | 6.900 |
| Perfection order | 609 | 4-28 | 21.64 | 4.343 |
| Bachelor degree studies | 346 | 6-28 | 21.39 | 4.000 |
| Master degree studies | 263 | 4-28 | 21.97 | 4.750 |
| Perfection discrepancy | 600 | 12-84 | 47.57 | 15.103 |
| Bachelor degree studies | 341 | 12-84 | 48.62 | 14.760 |
| Master degree studies | 259 | 12-84 | 46.18 | 15.460 |
| The sense of self-efficacy | | | | |
| Self-efficacy (Global score) | 603 | 15-40 | 29.99 | 4.212 |
| Bachelor degree studies | 345 | 16-40 | 29.60 | 3.993 |
| Master degree studies | 257 | 15-40 | 30.49 | 4.435 |

Table 2. The influence of the sense of one's own efficacy on authentic leadership skills

| Independent variables | b | $\beta_{std}$ | Confidence interval | | t | $P$-value |
|---|---|---|---|---|---|---|
| | | | -0.95 | +0.95 | | |
| Intercept | 36.766 | - | - | - | 18.574 | 0.00o |
| The sense of self-efficacy | 0.838 | 0.470 | 0.398 | 0.543 | 12.795 | 0.000 |

b – unstandardized regression coefficient, $\beta_{std}$ – standardized regression coefficient

Table 3. The influence of the sense of one's own efficacy on perfectionism

| Independent variables | b | $\beta_{std}$ | Confidence interval | | t | P-value |
|---|---|---|---|---|---|---|
| | | | -0.95 | +0.95 | | |
| Intercept | 21.032 | - | - | - | 11.224 | 0.000 |
| The sense of self-efficacy | 0.593 | 0.366 | 0.291 | 0.442 | 9.573 | 0.000 |

b – unstandardized regression coefficient, $\beta_{std}$ – standardized regression coefficient

Table 4. Mediation analysis

| Independent variables | b | $\beta_{std}$ | Confidence interval | | t | P-value |
|---|---|---|---|---|---|---|
| | | | -0.95 | +0.95 | | |
| Intercept | 30.584 | - | - | - | 30.584 | 0.000 |
| Perfectionsm (High Standards) | 0.275 | 0.251 | 0.177 | 0.326 | 6.607 | 0.000 |
| The sense of self-efficacy | 0.686 | 0.385 | 0.311 | 0.460 | 10.130 | 0.000 |

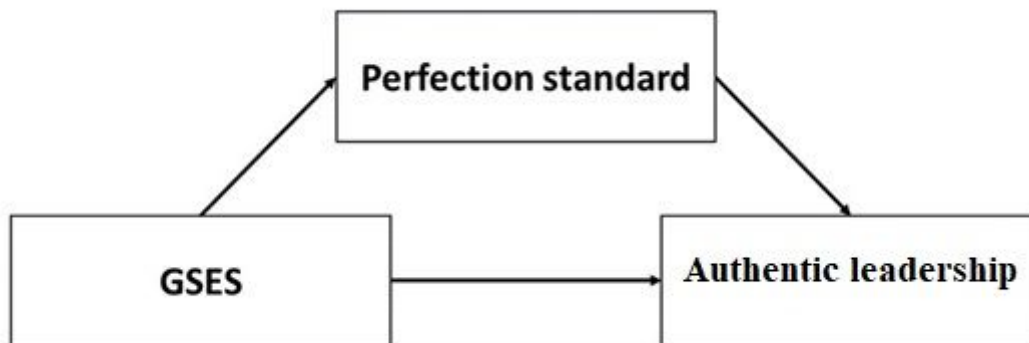b – unstandardized regression coefficient, $\beta_{std}$ – standardized regression coefficient

# Figures



## Figure 1

Theoretical model