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Melanocytic nevi and psychological impact in young adults
SUMMARY OF THE DOCTORAL THESIS

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LIST OF PUBLISHED SCIENTIFIC PAPERS

Niță, T., Predoiu, A., Szabo, G., Zahiu, M., Bitang, A. and Enescu, D.M. (2025) 'The impact of nevi and phototype on experienced stress and life satisfaction in the case of future teachers', *Journal of Educational Sciences and Psychology*, 15(76), pp. 218–232. doi: 10.51865/JESP.2025.1.19.

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Introduction

Congenital or acquired melanocytic nevi are treated not only as cutaneous lesions, but also as features with possible aesthetic, functional and psychosocial meaning. They are located at the intersection of dermatology, plastic surgery and psychology. Medically, they may require clinical and dermoscopic monitoring, regular self-examination and, in selected cases, surgical intervention. Psychologically, visible or extensive nevi may influence self-esteem, social anxiety and the way a person relates to his or her own body.

Oncological risk management is important. Nevi with potential risk, especially those located on the head or large and giant congenital nevi, may require advanced reconstructive procedures such as local flaps or skin grafts. Self-examination functions as secondary prevention because it allows individuals to observe suspicious changes and request medical evaluation. This preventive component is linked to awareness of health status and to reducing the risk of delayed diagnosis.

The psychological impact of nevi depends on lesion size, distribution and skin phototype. Visible melanocytic lesions or lesions covering large body areas may contribute to lower self-esteem and increased vulnerability to social anxiety, especially in childhood and adolescence. This concern is extended to young adults in professional training. The target populations include future teachers and future sports coaches, groups that will work in social contexts requiring communication, authority and emotional regulation.

The general objective is to explore the impact of melanocytic nevi on perceived stress and quality of life in young adults in training, especially future teachers. Participants are recruited from the National University of Physical Education and Sport and from the University of Bucharest. The research starts from the assumption that the presence of melanocytic nevi may be associated with psychosocial behavior. However, the introduction also prepares the reader for a non-uniform relationship, dependent on location, size, visibility and the psychological indicator being measured.

Variations in perceived stress are not uniform across anatomical location or nevus size, suggesting that the relation between visible dermatological characteristics and psychological functioning is domain-specific rather than global. There is also exploratory evidence regarding the relationship between automatic aggression in future sports coaches and the presence of

melanocytic nevi. The claimed contribution is the use of a biopsychosocial model in a field where the psycho-emotional impact of nevi is described as insufficiently explored.

I. GENERAL PART

The medical and psychological framework includes the definition and classification of melanocytic nevi, physiopathology, etiology, epidemiology and self-examination, followed by the psychological impact of nevi and implicit aggression. These elements justify the variables examined in the empirical studies.

1. Melanocytic nevi. General considerations

A benign melanocytic nevus is a non-malignant clonal proliferation of melanocytes. Melanocytes have an embryological origin in the neural crest and, in nevi, specialize into nevus cells. Physiopathologically, these lesions are interpreted either as consequences of disturbed melanoblast migration or as localized proliferations at junctional or dermal levels. This framing makes it possible to distinguish benign controlled proliferation from melanoma, which represents the malignant counterpart of the nevus.

Congenital melanocytic nevi differ from acquired nevi by time of onset and biological mechanism. Congenital nevi are abnormalities of embryogenesis caused by changes in melanoblast proliferation and migration from the neural crest to the ectoderm. They may be considered malformations or hamartomas, because they contain mature cellular elements arranged in an abnormal architecture. Acquired nevi, by contrast, are benign postnatal neoplasms, often related to environmental factors, particularly UV radiation, on a background of genetic susceptibility.

The common acquired melanocytic nevus has a typical clinical profile: diameter under 6 mm, regular borders, homogeneous color and frequent location in sun-exposed areas. Oral melanocytic nevi are benign proliferations of nevus cells in squamous epithelium or submucosa. They are much rarer than cutaneous nevi and are classified according to the position of cellular aggregates as junctional, intramucosal or compound. Their rarity requires careful differential diagnosis with oral mucosal melanoma.

The relationship between nevus and melanoma is explained through the contrast between controlled proliferation and loss of control. The nevus is governed by cell-cycle control and oncogene-induced senescence, whereas melanoma involves failure of these barriers, invasive

proliferation and metastatic potential. This distinction matters for the whole thesis because it explains why nevi are usually benign but remain relevant for clinical surveillance and psychological perception of risk.

1.1. Physiopathology, etiology and epidemiology

The classical Abtropfung theory, introduced by Paul Gerson Unna, states that nevus cells initially proliferate in the epidermis and then progressively migrate into the dermis as the lesion matures. This theory supports the classification of common nevi into three stages: junctional nevus, compound nevus and intradermal nevus. A junctional nevus has melanocytic nests at the dermo-epidermal junction; a compound nevus includes cells in both epidermis and superficial dermis; an intradermal nevus represents the mature stage, with cells located exclusively in the dermis.

The classical model is complemented by molecular biology. Nevomelanocytic precursors derive from the neural crest and migrate toward the epidermis during embryogenesis. This process is controlled by transcription factors and signaling pathways, including SOX10, PAX3, WNT/beta-catenin and MITF. SOX10 and PAX3 are important for early specification and maintenance of melanocytic identity, while MITF functions as a master regulator of melanocyte development. Disturbances in these mechanisms may contribute to nevus formation.

Ultraviolet radiation is an external mitogenic factor relevant to nevus number and density. The epidemiological studies cited in the thesis support a relationship between UV exposure and melanocytic nevus density, regardless of phototype. The suggested mechanism includes stimulation of melanocytic proliferation through somatic mutations and growth factors released by affected keratinocytes.

Genetic determination is an important predictor of nevus number. Twin studies indicate high heritability, estimated at about 65%. Visible pigmentary features such as eye color, hair and skin explain only a limited part of variability, while a larger genetic component is attributed to loci that remain incompletely identified. Nevus density is therefore the result of interaction between polygenic predisposition and environmental factors.

The epidemiology of congenital nevi is summarized through the difference between small/medium and large/giant forms. Congenital melanocytic nevi occur in about 1% of newborns, most being small or medium. Large nevi are much rarer but clinically more important because of their association with melanoma risk and possible neurocutaneous melanocytosis. The subchapter also mentions the linear increase in nevus number during childhood, especially between 6 and 12

years of age, under the influence of age, endogenous factors and actinic exposure.

1.2. Histopathology and immunohistochemistry

Histopathological and immunohistochemical assessment relates melanocytic lesions to the location of nevus cells and to their position at the dermoepidermal junction, in the dermis or in mucosal tissue. Junctional nevi contain melanocytic nests at the junction, compound nevi include both epidermal and dermal components, and intradermal nevi represent a mature stage in which nevus cells are located in the dermis. In the oral mucosa, histological classification follows the position of cellular aggregates as junctional, intramucosal or compound. Microscopic differentiation between benign proliferation and malignant transformation remains clinically relevant, because melanoma is described as the failure of proliferative control and as an invasive proliferation with metastatic potential.

1.3. Clinical characteristics and self-examination

Skin Self-Examination is an important tool of secondary prevention. Its role is to reduce delayed diagnosis of skin cancers through early identification of suspicious changes. The practice can be optimized by correlation with clinical examination by a dermatologist or family physician and by technologies such as mole mapping, which allows digital sequential monitoring of lesions.

Monthly skin self-examination is combined with periodic clinical examination. Data on self-examination prevalence include an Australian study in which more than one quarter of asymptomatic subjects reported performing skin self-examination during the previous 12 months.

Most cutaneous melanomas are initially detected by patients, partners, relatives or close persons. For this reason, patient education is a key part of prevention. Proposed strategies include algorithms for recognizing morphological markers of malignancy and photographic documentation for monitoring changes over time. Two cases of superficial spreading melanoma are presented: a 33-year-old woman with a lesion on the arm and a 31-year-old man with a lesion on the back, both illustrating the value of patient or family observation.

Public health campaigns should address both the general population and healthcare professionals. Their aim is to increase awareness of the clinical indicators of lesions with potential risk and of the psychological impact associated with visible cutaneous changes.

2. Psychological impact of nevi

Melanocytic nevi are common but highly variable in number, location, size and visibility.

Congenital nevi, especially large ones, may involve medical risks but also psychosocial consequences. Biological risk is connected with quality of life, particularly when lesions are located on the face, extremities or other visible areas.

Visible skin conditions may influence health-related quality of life, emotional state, social interactions and occupational functioning. Individuals with congenital melanocytic nevi may experience adverse social reactions such as intrusive questions, staring, avoidance, teasing or bullying. These experiences may contribute to anxiety, shame, lower self-esteem and social withdrawal. Psychological impact is not determined only by medical severity, but also by the social meaning of visible difference.

The literature has more often examined inflammatory skin diseases such as acne, vitiligo, atopic eczema and psoriasis than congenital melanocytic nevi. Many existing studies rely on parent reports, especially in children, leaving the direct perspective of adolescents and young adults less explored. This gap justifies the focus on self-reports and on young populations in professional training.

The psychosocial mechanisms include stigmatization, internalization of negative reactions, negative body image, maladaptive coping and social avoidance. A visible skin condition may function as a chronic stressor, especially during identity formation and in socially evaluative contexts. This idea is carried into the empirical studies, where future teachers and future coaches are analyzed in relation to stress, life satisfaction and automatic aggression.

2.1. General considerations

Melanocytic nevi are benign proliferations of melanocytes, while congenital and acquired forms differ by origin and clinical meaning. Congenital nevi are associated with embryological development and may be considered hamartomas or malformations, while acquired nevi are treated as benign postnatal neoplasms. Large and giant congenital nevi may involve melanoma risk and neurocutaneous melanocytosis, which requires surveillance and sometimes complex surgical interventions.

Clinical management is described as stratified according to size and risk. For small and medium congenital nevi, excision is mainly related to aesthetic and psychosocial reasons, with melanoma prophylaxis rarely being the main rationale. For large and giant nevi, staged surgical excision remains important for risk reduction and appearance improvement. This distinction supports the idea that therapeutic decisions must consider both medical risk and the consequences

for body image.

Intrusive questions, avoidance, teasing and bullying may cause emotional distress and increase the risk of psychosocial difficulties. Affected persons may use social avoidance to reduce stress, but this strategy can maintain isolation and affect the development of social skills. Visible nevi may therefore function as chronic stressors, especially in developmental stages in which body image and social acceptance are important.

Nevi may have consequences beyond the strictly dermatological level. Their impact depends on visibility, location, size, age, reactions from others and coping resources. Psychosocial support is part of a comprehensive approach to care.

2.2. Implicit aggression

Aggression should not be assessed only through explicit self-report questionnaires. In modern cognitive and social psychology, dual-process models distinguish between deliberate, conscious processes and automatic, implicit processes. This distinction is important because aggressive behavior may also be based on rapidly activated cognitive associations without full conscious control.

Aggression is defined as a dysfunctional behavioral trait expressed through physically or psychologically harmful conduct. This definition is linked to the need to measure both explicit and automatic aggression. The Implicit Association Test is a relevant tool for measuring automatic associations between concepts, because reaction times may reveal cognitive links not directly accessible through self-report.

Stigmatization associated with visible differences is connected to cognitive emotion regulation strategies. Responses to stressful social events, such as staring or teasing, can be analyzed as cognitive emotion regulation strategies. The way a person internally processes these situations may influence well-being and adjustment.

The biopsychosocial model explains adjustment to a medical condition or visible difference through the interaction between biological, psychological and social levels. In this model, nevus characteristics represent the biological and visible component, stigmatization and others' reactions represent the social component, while stress, shame, anxiety, coping strategies and implicit aggression represent psychological components. This framework prepares the transition toward the empirical studies.

II. PERSONAL CONTRIBUTIONS

The three empirical studies focus on perceived stress, life satisfaction and automatic aggression in relation to the presence, size, number and location of nevi. The first two studies examine future teachers or female future teachers, while the third examines future sports coaches. Together, they follow the same broad issue: the relationship between visible dermatological characteristics and psychological functioning in young adults in professional training.

3. Study 1. Impact of nevi and phototype on experienced stress and life satisfaction among future teachers

Facial and cervical nevi, their number and size, and skin phototype are analyzed in relation to perceived stress and general life satisfaction among future teachers. The research includes 67 participants, 47 women and 20 men, aged 21-22, third-year students at the National University of Physical Education and Sport and the University of Bucharest. Stress is measured with the Sense of Stress Questionnaire, while life satisfaction is assessed with the Cantril Scale.

Teaching is a profession with high social exposure, emotional pressure and constant evaluation. Visible characteristics such as facial or cervical nevi may create an additional layer of stress, but this assumption requires empirical testing. The data are therefore analyzed according to the presence of nevi, their size, their number and skin phototype.

3.1. Introduction

The teaching profession is associated with knowledge transmission, educational equity and student development. At the same time, teaching is an emotionally demanding occupation associated with academic stress, performance pressure, classroom management and complex professional demands. For future teachers, these pressures already emerge during initial training.

Physical education teachers teach sport skills, health knowledge, teamwork and emotional regulation. For them, stress may come from noise, student heterogeneity, infrastructure, equipment, the risk of student injury and curriculum limitations. Their emotional state influences the quality of teaching and the relationship with students.

Individual characteristics and physical appearance may influence the professional experience of future teachers. Because teachers are often observed and evaluated, visible skin features, including facial and cervical nevi, may influence self-esteem, professional confidence and stress. The nevus is defined as a chronic circumscribed lesion of the skin or mucosa, and the

difference between congenital and acquired nevi is supplemented by the explanation of phototype and the Fitzpatrick scale.

The literature on the psychological impact of nevi in young adults is limited. Visible skin conditions may influence quality of life and psychological adjustment, and people with congenital nevi may experience intrusive or stigmatizing social reactions. The aim of Study 1 is to investigate the impact of nevi and phototype on perceived stress and general life satisfaction in future teachers.

3.2. Material and methods

The design is cross-sectional and based on questionnaires administered online through Google Forms between November 2024 and February 2025. Participants gave informed consent, and recruitment used convenience sampling. The measures are self-reported and cover stress, life satisfaction, demographic characteristics, phototype and the presence of nevi.

3.2.1. Hypotheses

The five hypotheses concern differences in stress and life satisfaction according to the presence of facial and cervical nevi, number of nevi, nevus size and skin phototype. A separate hypothesis examines the association between the presence of facial or cervical nevi and the future teachers' phototype. The hypotheses therefore cover both visible dermatological characteristics and constitutional skin characteristics.

3.2.2. Participants and procedure

The participants are 67 future teachers, including 37 future physical education and sport teachers and 30 future preschool and primary school teachers. The physical education group includes both women and men, while the preschool and primary school group is entirely female. The procedure involved online completion of the instruments and questions on nevi, age, gender, eye color, hair color, skin color and skin reaction to sunlight.

3.2.3. Instruments

Stress was assessed with the Sense of Stress Questionnaire, which includes three subscales: external stress, emotional tension and intrapsychic stress. External stress reflects the feeling of unfair evaluation or pressure from others. Emotional tension reflects fatigue, anxiety, nervousness and difficulty relaxing. Intrapsychic stress reflects internal tensions, thoughts about the past or future and pessimistic evaluations. Life satisfaction was assessed using the Cantril Ladder, a visual scale from 0 to 10. Additional questions assessed phototype and the presence, number and size of

facial and cervical nevi.

3.2.4. Statistical analysis

Statistical analysis was performed in SPSS 20. Independent samples t tests, one-way ANOVA and chi-square association tests were used. For ANOVA, homogeneity of variance was checked using Levene test, and when conditions were met, Fisher test and Tukey post-hoc results were reported. Normality of distributions was assessed through skewness. This strategy allowed comparisons between groups according to nevus presence, number, size and phototype.

3.3. Results

The results show that the simple presence of facial nevi did not produce significant differences in perceived stress or life satisfaction among future teachers. Descriptively, participants without facial nevi had slightly higher stress scores, but the differences were not statistically significant. The same conclusion appeared for cervical nevi: their presence or absence did not significantly differentiate stress and life satisfaction scores.

Analysis of facial nevus size showed a significant difference for intrapsychic stress. Future teachers reporting facial nevi between 5 and 10 mm had higher intrapsychic stress than those reporting facial nevi under 5 mm. This finding partially supports the hypothesis concerning size. Differences in emotional tension and external stress descriptively followed a similar direction but were not significant.

The number of facial and cervical nevi did not produce significant differences in stress or life satisfaction. The size of cervical nevi also did not significantly differentiate groups. Phototype, however, was associated with emotional tension: participants with phototype II reported significantly higher emotional tension than those with phototypes III and IV. The chi-square test did not show a significant association between the presence of facial or cervical nevi and phototype.

3.4. Discussion

The presence of nevi is not sufficient to explain levels of stress or life satisfaction. The non-significant results for facial and cervical nevus presence suggest that the psychological impact is not global. Participants with facial nevi were descriptively less stressed, possibly because of social tolerance or because many belonged to the physical education group and practiced systematic physical activity, which is associated with stress reduction.

The important result concerns facial nevus size. Larger nevi, between 5 and 10 mm, were associated with higher intrapsychic stress, meaning greater internal tension, anxiety-generating thoughts and pessimistic evaluations. This result is consistent with literature showing that visible nevi may influence quality of life and psychological adjustment, especially through self-evaluation and self-consciousness. However, the study remains cautious and does not claim causality.

Phototype is also relevant. Future teachers with phototype II, who are more UV-sensitive and more likely to burn than tan, reported higher emotional tension than those with phototypes III and IV. This means more nervousness, anxiety and difficulty relaxing in daily situations. The result is relevant for teacher training because irritability and emotional tension may influence interactions with students, parents and colleagues.

The limitations include the use of the Fitzpatrick scale, which does not perfectly capture the diversity of skin tones, the use of self-report instruments, the inevitable influence of other factors on life satisfaction and stress, and unbalanced group sizes according to nevus size. Future research is proposed on different professional categories, separate gender groups and more homogeneous samples.

3.5. Conclusions

Intrapsychic stress differentiates participants with larger facial nevi from those with smaller nevi. Future teachers with facial nevi of 5-10 mm showed more mental tension and more self-related difficulties. Participants with phototype II also reported more nervousness and difficulty relaxing than those with phototypes III and IV. No significant association was found between the presence of nevi and phototype, and no global differences emerged according to the mere presence of nevi.

4. Study 2. Psychological stress variations according to the presence of nevi in female future teachers

The research moves from the face and cervical region to the trunk, upper limbs and lower limbs. The sample includes only female participants: 126 future teachers aged 21-24, enrolled in the third year at the University of Bucharest and the National University of Physical Education and Sport. The objective is to examine variations in psychological stress according to the presence, size and number of nevi in several body regions.

4.1. Introduction

Teaching is a high-demand profession with chronic work-related stress. Teachers are exposed to social evaluation, time pressure, emotional labor and constant interaction with students, parents and colleagues. In this context, visible or personally relevant body characteristics may become additional stressors, especially when the individual feels observed or judged.

Larger facial nevi had previously been associated with higher intrapsychic stress. The new research broadens the anatomical area studied by including the anterior and posterior trunk, upper limbs and lower limbs. This extension tests whether the relationship between nevi and stress depends on location and visibility or whether there is a more general effect of nevus number and size.

The Job Demands-Resources model explains occupational stress through the balance between demands and resources. High demands may produce strain, while resources such as social support, autonomy and feedback may reduce their impact. Chronic social evaluation, burnout, emotional labor and visible difference are also discussed. The brain-skin connection and the possibility that psychological stress may be linked to neuroendocrine, immune and cutaneous responses appear as well, with cautious interpretation.

4.2. Material and methods

The Sense of Stress Questionnaire is combined with questions on the presence, number and size of nevi on the trunk, upper limbs and lower limbs. Questionnaires were administered online through Google Forms during 2024-2025, with informed consent, confidentiality and anonymity. The analysis focuses on the three dimensions of stress: external stress, emotional tension and intrapsychic stress.

4.2.1. Hypotheses

The two hypotheses concern the effects of nevus size and number on stress. The first states that the size of nevi on the trunk and limbs significantly influences the stress experienced by female future teachers. The second states that the number of nevi on the trunk and limbs significantly influences perceived external stress, emotional tension and intrapsychic stress. These hypotheses separate the effects of size from the effects of number and examine different stress domains.

4.2.2. Participants

The sample included 126 young adult women, all candidates for the teaching profession,

aged 21-24. Of these, 74 were future preschool and primary school teachers, and 52 were future physical education and sport teachers. The exclusively female sample allows a more specific examination of stress and body awareness in this group, but limits generalization to men or other professional categories.

4.2.3. Instruments

The main instrument was the Sense of Stress Questionnaire, with the subscales external stress, emotional tension and intrapsychic stress. Higher scores indicate higher stress intensity. Additional items collected data on age, gender and nevus characteristics on the upper limbs, lower limbs and anterior/posterior trunk. For each area, presence, number and size of nevi were considered.

4.2.4. Procedure

The procedure consisted of the online administration of questionnaires and questions on nevi. Recruitment used purposive and convenience sampling. Participants were informed about the research and gave consent. Data were collected anonymously, which is important in a topic related to body appearance and psychological stress.

4.2.5. Statistical analysis

Analyses were performed in SPSS 20 using one-way ANOVA. Normality of score distributions was checked with the Shapiro-Wilk test, and homogeneity of variance with Levene test. When assumptions were met, Fisher test and Tukey post-hoc results were interpreted. Separate analyses were conducted for the size and number of nevi in different anatomical regions.

4.3. Results

For nevus size, the results showed a significant effect only for intrapsychic stress in the case of nevi located on the anterior and posterior trunk. Participants with nevi between 5 and 10 mm reported higher intrapsychic stress than those with nevi under 5 mm. No significant differences were observed for emotional tension or external stress according to trunk nevus size. The size of nevi on the limbs also did not produce significant differences for any stress dimension.

For nevus number, the results showed a significant effect on external stress in the case of nevi on the upper and lower limbs. Participants with 3-5 nevi reported higher external stress than those with no nevi and those with 1-2 nevi. No significant differences appeared for emotional tension or intrapsychic stress according to the number of nevi on the limbs. For the trunk, the

number of nevi did not significantly differentiate stress scores.

The results support the idea that the relationship between nevi and stress is specific rather than global. The size of trunk nevi appears linked to intrapsychic stress, meaning internal tension and negative thoughts about the self, past or future. The number of nevi on the limbs appears linked to external stress, meaning pressure felt in relation to others and social evaluation. This separation between stress domains is one of the main contributions of Study 2.

4.4. Discussion

The findings do not support a uniform influence of nevi on psychological stress. The relationship depends on anatomical region and the stress component analyzed. Trunk nevus size was associated with intrapsychic stress, while the number of nevi on the limbs was associated with external stress. This distinction is interpreted through visibility, body awareness and social evaluation. The limbs are more frequently visible in social contexts, which may explain their link with external stress.

Larger facial nevi were associated with higher intrapsychic stress in Study 1. Together, the two studies support a nuanced perspective: what matters is not the simple presence of nevi, but their size, location and personal meaning. Models of visible difference suggest that psychosocial impact emerges through social evaluation, self-consciousness and appearance concern, rather than through medical severity itself.

The practical implications concern teacher training, stress management, psychoeducation and emotional support, especially for individuals who experience vulnerabilities related to body image or stigmatization. The interpretation remains non-deterministic: nevi are not presented as inevitably harmful factors, but as possible contextual indicators that may interact with professional demands, personal resources and social support.

4.4.1. Limitations and future directions

The limitations of Study 2 include the exclusively female sample, the cross-sectional design and the exclusive use of self-report. These aspects limit generalization and do not allow causal inference. Responses may be influenced by personal interpretation, social desirability or temporary emotional states. Future research should include male participants, more diverse age groups and mixed methods.

Future directions include objective indicators of stress, such as hair cortisol, longitudinal

designs and testing reciprocal pathways between stress and cutaneous characteristics. Future studies should also include mediators such as perceived visibility, stigmatization, resource loss and cognitive stress appraisals. The aim is to move from cross-sectional associations to more robust explanatory models.

4.5. Conclusions

Psychological stress varies according to nevus characteristics, but only in specific domains. Trunk nevus size differentiates intrapsychic stress, while the number of nevi on the limbs differentiates external stress. Significant differences do not appear for all stress components or all anatomical regions. The central finding is that location and visibility may shape specific stress domains rather than global stress experience.

5. Study 3. Automatic aggression of future sports coaches is influenced by the presence of nevi - exploratory study

Automatic aggression becomes the central indicator instead of perceived stress. The relationship between implicit aggression in future sports coaches and nevus visibility is explored through size and number, together with the possibility that nevus presence can predict automatic aggression. The final sample includes 89 male future sports coaches aged 20-22, third-year students at physical education and sport faculties in Romania.

5.1. Introduction

Aggression in sport has mostly been studied through explicit self-report measures and situational determinants. Automatic processes should also be examined because aggressive behavior may be influenced by cognitive associations operating outside conscious control. The Implicit Association Test is used to evaluate these processes.

Automatic aggression is related to appearance-related factors, especially visible nevi. Future coaches will work in environments involving intense social interaction, authority and exposure to evaluation. In this context, visible skin features may influence social perception, stress, self-presentation and the way a person interprets social cues. Visible nevi may function as chronic or situational cues of social-evaluative threat.

The theoretical framework includes cognitive neoassociation theory, according to which negative affect may activate associative networks related to anger and aggression. If visible nevi are associated with tension, shame or anticipated stigmatization, they may be indirectly linked to

the activation of automatic aggression-related associations. The study remains exploratory because the literature on visible cutaneous markers and automatic aggression in coaches is described as almost absent.

5.1.1. Research questions

Three research questions replace firm hypotheses. The first asks how nevus size on the face, trunk and limbs influences automatic aggression in future coaches. The second asks how automatic aggression varies according to the number of facial, limb and trunk nevi. The third asks to what extent nevus presence predicts implicit aggression. The use of questions rather than hypotheses is justified by the exploratory nature of the field.

5.2. Material and methods

The ex post facto design combines self-reported nevus characteristics with an indirect measure of automatic aggression. Participants are future coaches in sports involving direct contact with an opponent, such as football, martial arts, handball and basketball. This inclusion criterion is relevant because these sports involve physical interaction, competition and regulation of aggression in performance contexts.

5.2.1. Participants

Initially, 93 male future coaches, clinically healthy and aged 20-22, participated. After excluding four participants based on criteria related to IAT D scores, the final sample included 89 participants. All were third-year students at physical education and sport faculties in Romania and were expected to become certified coaches within a few months or at most one year.

5.2.2. Methodology

Automatic aggression was measured through the Implicit Association Test in the classical seven-block version. Participants classified words related to Aggression, such as threat, insult, hit, beating and swearing, and words related to Non-Aggression, such as respect, fairness, encouragement, fair play and discipline. These categories were paired with stimuli related to Self and Others. Faster reaction times indicate stronger automatic associations between concepts.

The D4 score was used to calculate IAT results. A positive D score indicates a stronger association between Aggression and Self, while a negative D score indicates a stronger association between Aggression and Others. In this study, negative scores showed that participants automatically associated aggression more with others than with the self. Data on nevi were

collected through closed and open questions about the number and size of nevi on the face, limbs and trunk.

5.2.3. Procedure

The research was conducted between October 2024 and January 2026. Participants completed the IAT on a computer through PsyToolkit, and the questionnaire on demographic data and nevi was completed through Google Forms. The test could not be completed on a phone. The experimenter provided clarifications about nevi, and the questionnaire included introductory information so that participants could report presence, number and size in different body regions.

5.2.4. Statistical analysis

Analyses were performed using Jamovi and IBM SPSS Statistics. One-way ANOVA and Tukey post-hoc tests were used for group comparisons after checking homogeneity of variance with Levene test. Normality of D scores was assessed through skewness and kurtosis. Binomial logistic regressions were used to test prediction of automatic aggression from nevus presence, and effect size was expressed through Nagelkerke R².

5.3. Results

The results showed that future coaches obtained negative D scores, meaning they automatically associated Aggression with Others rather than with Self. This tendency is explained through the words used for the aggression category, which refer more to hostile forms of aggression than to instrumental aggression accepted in sport.

ANOVA indicated significant differences in automatic aggression according to facial nevus size and the number of nevi on the upper and lower limbs. Future coaches with facial nevi under 5 mm or between 5 and 10 mm differed significantly from those without facial nevi, showing stronger automatic associations between Aggression and Others. Participants with 1-2 nevi or 3-5 nevi on the limbs also differed significantly from those without nevi in these areas.

No significant differences were identified for the number of facial nevi, the size of nevi on the limbs, or the number and size of nevi on the trunk. Descriptive statistics nevertheless indicated a tendency for implicit aggression to increase as the number of facial and trunk nevi increased, but these differences did not reach statistical significance. The significant findings therefore remain concentrated on facial nevus size and the number of nevi on the limbs.

Binomial logistic regressions showed that facial nevus size and the number of nevi on the

limbs could predict automatic aggression, although with moderate-to-weak effect sizes. The models were statistically significant and correctly classified roughly two thirds of cases. The result is interpreted as exploratory evidence: larger facial nevi and more nevi on the limbs are associated with a higher probability of stronger automatic association between Aggression and Others.

5.4. Discussion

The results extend the understanding of aggression in sport contexts by including appearance-related markers. Automatic aggression varied according to facial nevus size and the number of nevi on the limbs, suggesting that visible skin features may relate to automatic cognitive processes. The central interpretation is that future coaches with such characteristics may implicitly associate aggression with others, possibly because of anticipated criticism or social threat.

These results connect with psychosocial models of visible difference. People with visible skin features may be more vigilant toward social reactions, more concerned with how they are evaluated and more sensitive to cues of rejection. In sports settings, where coaches must show authority, emotional control and fast communication, these processes may become particularly relevant. However, the association should not be interpreted as evidence that nevi produce aggressive behavior.

The link with Studies 1 and 2 is given by the association between larger nevi and specific forms of stress. Nevus size, especially on the face, appears to be related to psychological phenomena such as intrapsychic stress and automatic aggression. The effect may operate through negative affect and activation of aggression-related associative networks, but this remains a hypothesis for future research.

The limitations include the homogeneity of the sample in age and gender, small size of some subgroups, subjective reporting of nevi and the contextual nature of the words used in the IAT. Future research should include women, experienced coaches, different sports, direct dermatological assessment and other methods for measuring automatic aggression. Longitudinal designs are also recommended to clarify the direction of the relationship between nevi, stress and implicit aggression.

5.5. Conclusions

There is exploratory evidence regarding the relationship between nevus presence and automatic aggression in future sports coaches. Larger facial nevi and a higher number of nevi on

the upper and lower limbs were associated with stronger implicit links between Aggression and Others. The associations are moderate to weak and must be interpreted cautiously, but they suggest that visible cutaneous markers may be relevant for automatic aggression-related cognitive processes in sport contexts.

6. Conclusions and personal contributions

The results of the three studies are brought together within the biopsychosocial model. Melanocytic nevi appear not only as benign cutaneous formations or lesions requiring oncological monitoring, but also as features that may interact with stress, life satisfaction, social evaluation and automatic cognitive processes. The psychological impact of nevi is not uniform and cannot be inferred from their mere presence.

Empirically, Study 1 shows that the simple presence of facial or cervical nevi does not significantly differentiate stress and life satisfaction, but facial nevus size is associated with higher intrapsychic stress. In the same study, phototype II is associated with higher emotional tension than phototypes III and IV. Study 2 confirms the specificity of the results: trunk nevus size is associated with intrapsychic stress, while the number of limb nevi is associated with external stress. Study 3 extends the analysis to automatic aggression, indicating associations between larger facial nevi, the number of limb nevi and implicit links between Aggression and Others.

The personal contribution lies in investigating a topic that is underexplored in Romania and in the international literature: the relation between melanocytic nevi and psychological functioning in young adults in professional training. The populations studied - future teachers, female future teachers and future coaches - are relevant because their future professions involve social exposure, repeated interactions and emotional regulation. From a methodological point of view, the research uses both explicit stress measures and an implicit measure of aggression.

Interpretation remains cautious. The results do not show that nevi directly cause stress or aggression, but that certain characteristics - size, number, location and visibility - may be associated with specific psychological domains. Future directions include longitudinal studies, objective dermatological assessment, larger and more diverse samples, analysis of gender differences and integration of physiological stress markers. A holistic approach links medical evaluation with psycho-emotional support.

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