

Article

# Skin Visual thinking strategy (VTS) and art production to improve training and prevent burnout among healthcare students: protocol of a field trial

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**Abstract.** *Background:* during university many healthcare students face high stress that can lead to depressive symptoms, worst academic outcomes and socio-relational difficulties. It is necessary to prevent distress and improve quality of life among students teaching them skills to build resilience as observational capacities, critical thinking, work in team and empathy.

*Methods:* the present work describes the protocol of a field trial that contemplates to improve visual literacy skills, decrease stress, promote active listening and work in-group among medical students. The intervention group will be involved in art sessions according to the visual thinking strategies (VTS) method while the control group will not take part in art activities.

Scores about stress level (SL), empathy (EM), and skills related to VST (SKvts) will be measured. Questionnaires will be handed out to both groups at the beginning and at the end of the study. Univariate analysis, spearman correlation and multivariate analysis will be applied to analyze the outcome scores among the intervention and control groups.

*Conclusion:* the use of art in medical training is widespread worldwide, but it is an innovation in the Italian university medical curricula. It is fundamental to teach observational skills, improve psychosocial abilities and lower stress in order to educate professional and resilient future healthcare workers.

**Keywords:** Visual Thinking Strategies, healthcare students, burnout, life-skills.

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## Introduction

Several studies have investigated how to teach and improve skills as visual literacy, work in team, critical thinking, empathy and active listening among healthcare students. These skills are important in clinical practice for correct diagnosis and treatment but also to develop patient-therapist relationship (1-2).

Lack of these psychosocial skills added with difficulties related to medical school such as work overload, university disorganization, lack of adequate personal social capital could lead to high stress level among students. Continuous and unmanaged stress can have severe consequences as lower mood with further complications if burnout continues into residency and beyond (3). Indeed, the prevalence of depressive symptoms or of clinical depression is high among medical students (4).

Moreover, McCain et al. showed that despite high levels of resilience, doctors have high levels of burnout and secondary traumatic stress. Improving personal resilience offers much benefit to professional and personal quality of life. (5) Interventions that focus on increasing overall well-being since medical training are highly recommended, including school-based and individual-based activities (3).

The observation of art can help to develop visual skills and is used to manage and reduce stress, ultimately influencing approach with patients (1,6). The use of art can influence our brain and represent a powerful resource for psychophysical wellbeing. In the RCT of Bolwerk the art production group showed increase in psychological resilience and greater spatial improvement in the functional connectivity of the posterior cingulate cortex (PCC/preCUN) to the frontal and parietal compared to the cognitive art evaluation group (7).

One of the technique used by art-based programs is the Visual Thinking Strategy (VTS). It is a pedagogical approach and (8) an evidence-based method that uses observation and discussion on art (9). Questions that introduces VTS sessions are developed to initiate discussions about art images and promote critical thinking skills, visual literacy, and collaborative interactions among peers (10).

Medical humanistic disciplines have the potential to develop numerous psychosocial skills. Medical and nursing education curriculum support traditional teaching with "Medical Humanities" which are human sciences as literature, narrative, poetry, theater and visual arts (6).

The VTS method was used first time in Sapienza University of Rome in 2014 (11). The preliminary study of VTS impact on student competencies within the C degree course of Sapienza University of Rome in 2015. The first results indicated improvement in the skills related to the observation and critical thinking. The objective of this study is to evaluate if VTS and art production course is effective on lowering stress and improvement of visual literacy skills and empathy among medical students.

## Methods

### *Study design and participants*

This project will be a randomized field trial designed according to Consort statement (12). "VTS and production of art" is an intervention that will be delivered to health profession students of the Faculty of Pharmacy and Dentistry. Participants involved will be the medical students who attend the third to fifth year of course. The course will be held from October 2018 to June 2019.

The following eligibility criteria will be applied:

- Participant must be aged between >18 years;
- Participant must be undergraduate and full-time student;
- Participant must be in the third to fifth year of her/his study.

The following exclusion criteria will be applied:

- Participant is not a full-time student;
- Participant is not a medical student from third to fifth year of course.

## Setting

The meeting will be twice a month at the Laboratory of Art Medical Humanities in Sapienza or at the museum in Rome, the practice of observation and artistic production will last an hour and a half each meeting. The control group will not be involved in art activities.

## Intervention: VTS method

The intervention group will be involved in art session through the visual thinking strategies method (VTS) about artistic and clinical images and the artistic production.

Visual thinking strategy includes the following questions "What is going on in this picture? What visual elements support what you said? What else can you see?" to initiate discussion about art images. The artistic production will be drawing, painting with various tools and different approach to stimulate visual literacy and reduce stress. Meanwhile work in-group, comparison and discussion among students, will stimulate active listening and respect of other's opinions.

### *Course Overview*

- Third year: introduction to VTS and practice at the Laboratory of Art Medical Humanities in Sapienza and at the museum;
- Fourth year: practice of VTS, experiments of ico-diagnostics and active listening exercise: two students, one of them describes an image of art behind or in front of the other student. The other draws according to the description that is given by his/her companion of work;
- Fifth year: practice of VTS on clinical image, artistic production and ico-diagnostics activities.

## Outcomes

The outcomes examined before and after the intervention will be SL, SKvts and EM using correspondent validated scales:

- Stress level (SL score) through Maslach Burnout Inventory (MBI). This is the most frequently used questionnaire to measure burnout; includes 22 items that measure all three burnout dimensions: emotional exhaustion, depersonalization and low personal accomplishment (13).
- Visual literacy skills, critical thinking, work in team (SKvts score) through Milkova scale for assessment of visual analysis (14) integrated with Student Thinking Assessment (15) adapted in an Italian version. The scale measure five items related to five visual elements using a 5-point Likert scale response format ranging from 0 point indicating "low accomplishment" to 4 indicating "full accomplishment".
- Empathy (EMscore) through the Balanced Emotional Empathy Scale (BEES) with 15 items positively directed and 15 negatively directed (16).

## *Statistical analysis*

The computer software IBM SPSS statistics 25 will be used to store, recode and analyze all data and to examine our main research questions. Descriptive statistics will be calculated to present the sample and to determine the levels of stress, empathy and skills related to VTS. Occurrence metrics as frequencies and percentages will be reported for included qualitative variables while mean, median, range, standard deviation (SD) for continuous variables. For both types of variables, missing data will be reported. For each group, age and gender distribution will be analyzed.

Smirnov Normality test will be preliminarily applied. The following statistical tests will be used to evaluate differences between SL, EM, SKvts and participation to VTS course: Mann-Whitney tests for non-normal distributions, Student's t-test for normal one. The correlation between continuous variables will be evaluated using Spearman's coefficient. Multivariate linear regression will be performed to evaluate relationship between SL, EM, SKvts and independent variables as age, gender, year of course and participation to intervention. The statistical significance will be set at  $p < 0,05$ .

## Conclusions

Stress and burnout among healthcare students is common (4). At the beginning of the university career, students have to face several potential challenges as: change residency, became independent and face new realities as hospital and illness (17).

However, only few studies focused on lowering stress and improving psychosocial skills among medical students. The observation of art can help to develop life-skills and has been used to decrease anxiety and manage emotions.

University is a central setting for health prevention and promotion of quality of life, personal growth and to create positive relationships (17). The use of art can help to shape resilient students improving individual resources as empathy, critical thinking, listening, communication and observation skills so important to improve relational resources with new colleagues and friends and with the patient. The project “VTS and production of art” has the aim to improve visual capacities and improves skills related to interpersonal communication and regulation of emotions. Medical training should be accompanied by medical humanities as literature, theater and visual arts (6). VTS intervention is an innovation in the Italian medical curricula and this protocol has the objective to study its effectiveness.

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