Hamburg University of Applied Sciences

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Mindfulness and Resilience in Teaching Professionals

– An Intervention Study –

Master Thesis

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Abstract

Background: The empirical research of mindfulness training programs has increased recently but has not kept up with the growth of mindfulness interventions in the school setting. Research on the effects of mindfulness training for teaching professionals in mental health is rare (Jennings, 2016). Resilience is an important personal trait for managing work related demands and it contributes to a healthy workforce.

Objective: To identify the effect of a mindfulness training for teachers with reference to possible improvements of the mindfulness level and resilience level.

Method: This is a non-randomized intervention study with one intervention group (n=15) and one control group (n=29). Teachers in the intervention group got mindfulness training. The control group got training on other topics. The trainings were organized by the school authority. Due to the timeline of the trainings the study had a late entry point. Standardized questionnaires were administered at the last day of intervention (t1) and at a follow-up appointment four months after the last intervention (t2). To test if mindfulness has an influence on resilience two linear regressions were conducted. Further, repeated measures ANOVA and Paired Samples T-test have been used for testing how the mindfulness scores and the resilience scores change over time and differ among the groups.

Results: It can be assumed that mindfulness positively predicts the resilience level of teaching professionals. ANOVA were significant for the t1 ($F[2,30]=7,65$, $p = ,002$) and t2 ($F[2,38]=7,182$, $p = ,002$). However, the effect of the group was no longer significant at t2 ($p=0.083$). Also, analysis showed small effect sizes (t1: Adjusted $R^2 = ,294$, t2: Adjusted $R^2 = ,236$). Further, there was no significant main effect between intervention and control group referring the mindfulness core ($F[1,28]= ,821$ $p= ,373$, partial $\eta 2= ,028$) and the resilience score ($F[1,28]= 3,092$ $p= ,093$, partial $\eta 2= ,098$). Also, statistically significant interaction effects between the group factor and the time factor was not found. Moreover, the model also showed low observed power for mindfulness (14,1%) and resilience (39,0%).

Conclusion: Even though mindfulness was a statically significant predictor for resilience the group factor did not reach significance in most other analyses. Results must be interpreted with caution. Small effect sizes, low statistical power and the wide range of limitations lead to a conclusion that in this setting the mindfulness training did not improve the mindfulness and resilience level in teaching professionals. Further research should use randomized controlled designs with larger samples or focus on gaining a greater understanding of how workers adopt mindfulness to clarify optimal training approaches.

Content

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List of Abbreviations

A	Ausbrennen (overextension)
Adjusted R^2	Variation explained by the model in the population
ANOVA	Analyses of variance
ArbSchG	Arbeitsschutzgesetz (German Occupational Safety and Health Act)
ARS	Adolescence Resilience Scale
AVEM	Arbeitsbezogene Verhaltens- und Erlebensmuster (Work-Related Behavior and Experience Patterns)
B	Burnout (burnout-syndrome)
B	Slope coefficient
BPFI	Baruth Protective Factors Inventory
BRCS	Brief-Resilient Coping Scale
BS	Berufliche Schule (technical school)
BSB	Behörde für Schule und Berufsbildung Hamburg (School Authority Hamburg)
CD-Risk	Connor–Davidson Resilience Scale
CHIME-ß	Comprehensive Inventory of Mindfulness Experiences beta
CI	Confidence Interval
df	Degrees of freedom
eg	For example
F	F distribution/ F-Test
FFMQ	Five Facet Mindfulness Questionnaire
FMI	Freiburg Mindfulness Inventory
FS	Sonder-/Förderschule (specialschool)
G	Gesund (healthy)
GS	Grundschule (elementary school)
GYM	Gymnasium (grammar school)
KIMS	Kentucky Inventory of Mindfulness Skills
Li	Landesinstitut für Lehrebildung und Schulentwicklung Hamburg (State Institute of Teachers Education and School development Hamburg)

M	Mean of the sample
MAAS	Mindful Attention Awareness Scale
MBSR	Mindfulness-Based Stress Reduction
MMS	Mindfulness/Mindlessness Scale
n	Number of cases
p	Statistical probability
partial η2	Partial Eta Squared/ estimate of the population effect size
PHLMS	Philadelphia Mindfulness Scale
R^2	variation explained by the model in the sample
RS	Resilience Scale
RS-11	Resilience Scale short form
RSA	Resilience Scale for Adults
S	Schutz (conservation)
SD	Standard deviation of a sample
SDR	Systemic Demands-Recourses Model
SMQ	Southampton Mindfulness Questionnaire
STS	Stadtteilschule (comprehensive school)
t	Tdistribution/ T-test
t1	First time point of measurement
t2	Second time point of measurement
vs	Versus

1 Introduction

In a globalized and dynamic world, the school system has to face new challenges.

On the one hand, the connection between the teachers professional ability like offering good quality lectures and improving students' performance has been confirmed (Hattie, 2003). Therefore, teachers have to have a high standard of professional quality as a personal claim (Hillert & Schmitz, 2004).

On the other hand, changes in society and politics or administrative requirements affect the tasks and the role understanding of teaching professionals. This leads to a significant and complex demand for the work force (Rothland, 2013)(Harris, Jennings, Katz, Abenavoli, & Greenberg, 2016).

Teaching is a stressful profession which includes coping with the management of emotions and complex work tasks (Roeser, Skinner, Beers, & Jennings, 2012).According to Schaarschmidt (2004)work-related behavior analyses showed overextension at the workplace and symptoms of burn-out in 59% of the teaching professionals. Only 17% of the teaching staff were considered healthy. This mental health burden can also lead to early retirement (Weber, 2004).

Despite this, some researchers consider organizations as the root cause of for mental health determinants (Bauer & Gregor, 2013, 1). If inadequate work strains exist the employer has a duty of care for the health of the employees at the work place in Germany (Gesetzliche Unfallversicherung, 2013). A straining situation exists if there is constant imbalance between demands and resources emerges. Then intervention is needed (Lange, 2004).

One possible concept for intervention organized by employers is mindfulness training. Researchers suggest that mindfulness based interventions can positively influence employees' physical and mental health (Kersemaekers et al., 2018). Since earlier studies already reported the effects of workplace mindfulness interventions on stress reduction, sense of autonomy or self-regulation, this study seeks to clarify specifically the effect on the teachers' resilience. Being highly resilient to the demands of this profession is an important outcome for employee and employer in the context of an healthy and capable work force (Paulus, 2008)(Kersemaekers et al., 2018)(Spence, 2016).

For further clarification this study will first offer theoretical background. Demands, resources and the importance of balance will be described. To underline the public health relevance, the special demands of the teaching profession and comprehensive health data are given. For gaining a deeper understanding on mindfulness and resilience both concepts will be described. Also, the current state of research will be discussed. Then, following the evidence, the research question will be stated.

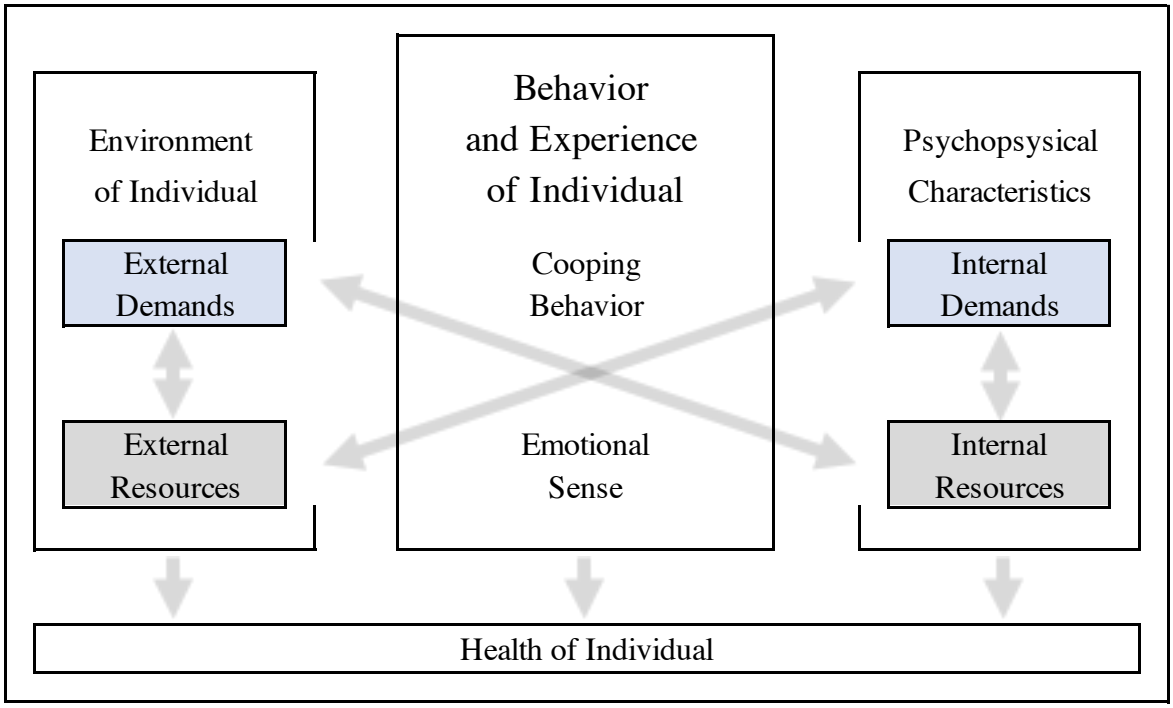
2 Background

Having a stable and sustainable mind at the workplace means having a balanced ratio between inner and outer expectations, personal willingness to fulfill the job expectations, and the personal ability to meet the expectations (Heyse, 2004). This chapter will explain the interactions between these factors and will give concrete examples of demanding situations in the work life of teaching professionals.

2.1 Health as a balance between demands and resources:

Among other influencing factors, the health status of an individual is dependent upon how well the person can overcome internal and external requirements by using internal and external resources (Becker, 2003). The Systemic Demands-Resources (SDR) Model of Health is based on other common models and theories like the Stress and Coping Model by Lazarus or the Salutogenesis Model by Antonovsky. The model describes a health promotion approach based on demands and resources. Figure 1 presents the model and the interactions with reference to the effects on the individual.

Figure 1: SDR- Model of Health; modified based on (Becker 2003, 14)



In general, requirements or *demands* are defined as conditions. External demands or conditions are explained by environmental factors of the individuum like cultural norms, social situation, or work demands. Internal demands are results of personal values, goals, desires and needs.

The person has to deal with the influencing demands. More specifically, to overcome the demands the individual has to use *resources.*

The resources are either internal or external resources. External resources are those offered by the environment like social supports (systems, good relationships with important people, self-help groups or social reputation), job resources (employment, degree of work control, working conditions) or material recourses (income, housing). Internal resources are explained as available psychological capacities like skills, personal traits, sense of coherence and physical capacities like body fitness (Becker, 2003).

A person's behavior and experience in life is a result of the inner emotional reactions and the coping behavior of individual. Coping mechanisms and the emotional state are influenced by the interaction of conditions and resources. Further, the coping mechanisms and the emotional awareness form the level of well-being, the needs and life-satisfaction. All of that determines are influencing the individual's health status (Nieskens, Rupprecht, & Erbing, 2012). The subjective awareness of handling difficult situations or life circumstances based on personal competences is called self-efficacy. This subjective awareness also decides whether a situation is experienced as a mental strain (Schaarschmidt, 2004).

Seen from another perspective, by trying to overcome the demands and requirements an imbalance between resources and demands can result in the experience of failure. Additionally, failure can be are accompanied by negative emotions (Shepherd & Cardon, 2009).

Applying this in the occupational health context, a poor allocation of job demands on the one hand and deficits or a lack of personal or job resources on the other hand can negatively influence the health status of workers (Nieskens et al., 2012).

The school as a work place has special and complex work demands (Rothland, 2013). Additionally, the role of the teacher and the social reputation of the teaching profession have changed in the last decades. For instance, while once the teachers level of authority was high, today the teachers might have to deal with a lack of students discipline or other challenges (Hillert & Schmitz, 2004).

Following the SRD model, the next section will display job specific demands of teaching professions. It will describe why these demands can possibly be experienced as stressful or loading. After that, a description of the current health status of teachers will be given.

2.2 School as a special workplace considering misallocated demands

The teaching profession has a broad range of external requirements and heterogeneous expectations. Teachers have to teach, to educate, to consult, innovate, to participate and also to cooperate with many different people and stakeholders. This requires an up-to-date educational knowledge and likewise a high level of self-reflection or emotional and communicational skills (Sieland, 2004).

External demands are explained here as influencing factors on the macro and meso level while the internal demands are descried as factors on the micro level in the school setting.

Focusing on external demands for the teaching profession, changes in educational politics lead to high and constantly changing bureaucratic and pedagogical requirements (Rothland, 2013). Handling new educational models, larger classes, high teaching loads, an increased amount of paper work, commuting between different schools or teaching locations, and unsuitable or noisy classrooms are some examples of the complex working conditions in this profession. The teaching profession is also affected by societal changes like an older average age of the work force and shifting values in society like the changing picture of parents' or teachers' responsibility. This results in diverse social factors like dealing with self-determining students and difficult parents, comprehensive communication with many stakeholders like students, school directors, colleagues and school principals. These circumstances can lead to demanding experiences (Heyse, 2004).

Additionally, on the micro level, unfavorable personal circumstances, low degree of individual resilience, rare opportunities to recover during breaks, bringing work back home like preparation of content for lectures or grading tests, and a lack of incentives to improve job performance can impact mental health. Further, a lack of qualification due to the ongoing addition of new responsibilities and tasks like inclusion, gender specific teaching, teaching of intercultural and environmental competences, and computer-based learning, can be examples for internal demands in the teaching profession (Paulus, 2008).

In summary, teachers can be confronted "with a host of occupational stressors during the course of their workday" (Grayson & Alvarez, 2008, 1350).

Consequently, if adequate resources are missing, a lack of pedagogical or lecture specialized know-how, unclear role definitions or emotional pressure can result which can lead to a loss of self-efficacy (Heyse, 2004).

This is based on a mismatch between expectations, personal willingness to fulfill the expectations and the personal ability to meet the expectations, for instance caused by a lack of resources to improve personal and professional skills. The mismatch can also appear after a long process over time in case the personal development of the teachers do not keep in pace with the occupational changes (Heyse, 2004).

Without an adjustment of either external conditions or providing opportunities for improving individual qualifications and personal job-related skills (e.g. by professional trainings) these imbalances can lead to overextension and job-related psycho-somatic diseases (Schaarschmidt, 2004).

Especially in psycho-social demanding jobs like the teaching profession the response on work strains is highly dependent on the individual resources. Therefore, it is an important matter to promote the personal resources and skills of teachers (Lange, 2004).

Based on this, the next section will give insights on work-related health status of teaching professionals to further clarify whether an adjustment of the internal and external work demands is really necessary for this profession.

2.3 Health status of teaching professionals

Of course, every occupational field has its specifics and differences (Hillert & Schmitz, 2004). Nevertheless, it has to be considered and mentioned that that teaching professionals are not a group of people which are randomly picked out of the general population, since there is a selection bias due to different factors (Hillert & Schmitz, 2004)(Scheuch, Haufe, & Seibt, 2015).

The motivational aspects why people choose to work in this profession, the large proportion of teachers working part time and also differences in the gender distribution must be considered (Hillert & Schmitz, 2004).

According to the *Statistisches Bundesamt* (Federal Statistical Office), 807.000 teachers are employed at German Schools in the school year 2016/17. Among them, 340.000 teachers work part-time (Statistisches Bundesamt, 2014). Moreover, 73% of all teaching professionals at German schools were female (Statistisches Bundesamt, 2018).

The majority of teachers in Germany have the status of civil servant. While is mostly the case for the western states of Germany, the eastern states rather offer regular employment (Weber, 2004).

But also on the state level distinctions occur because different school settings like teaching on primary vs teaching on secondary school influence demands and health outcomes. Even in the same state and the same school type differences in health status can appear (Schaarschmidt, 2004).

Detailed analytical data and research for the heterogeneity is still limited (Hillert & Schmitz, 2004). Further, all statements made on the topic of the teachers health status are based on which diagnostic tool was used by the author (Scheuch et al., 2015).

Due to the limited length of this study, only data for early retirement caused by disability and the results of the well-established and standardized instrument *Arbeitsbezogene Verhaltens- und Erlebensmuster* (Work-Related-Behavior and Experience Patterns, AVEM) is stated.

2.3.1 Early retirement due to disability

In many job professions there is a growing trend towards early retirement in Germany (Weber, 2004). Also, scientific concerns exist that early reterement is a multidimensional process which is influenced by society, law, social medicine and the individual (Scheuch et al., 2015).

For whatever reasons, 50%-60% of all teaching professionals in Germany retired early due to illness over the last 10 years. The peak of 64% was reached in the year 2000. Since then, the amount decreased, 2011: 19%, 2016: 12% (Scheuch et al., 2015) (Weber, 2004) (Statistisches Bundesamt, 2017). Out of all disease related early pensions among teachers, 52% were caused by ICD-10 classified psychological or behavior-related disorders and diseases (Weber, 2004). This makes mental disorders and diseases the major cause for early retirement from work in Germany (DRV, 2017).

2.3.2 Work-Related Behavior Patterns

Focusing on mental health work strains and the behavior at the work place, the AVEM is explained. The AVEM instrument was used to gather information about the health status of teachers in one of the biggest German health surveys for school staff with over 7000 participants called *Potsdamer Lehrerstudie* (Potsdamer Teachers Health Study) in the year 2002 to 2007 (Laux & Schaarschmidt, 2007). For reasons of comparison, 5000 workers from other professions but also mostly employed in the public service were included.

The instrument covers a wide range of indicators for individual behavior and experiences based on the profession like work management, physical and mental health status and work-related emotions. Health risk patterns were conducted.

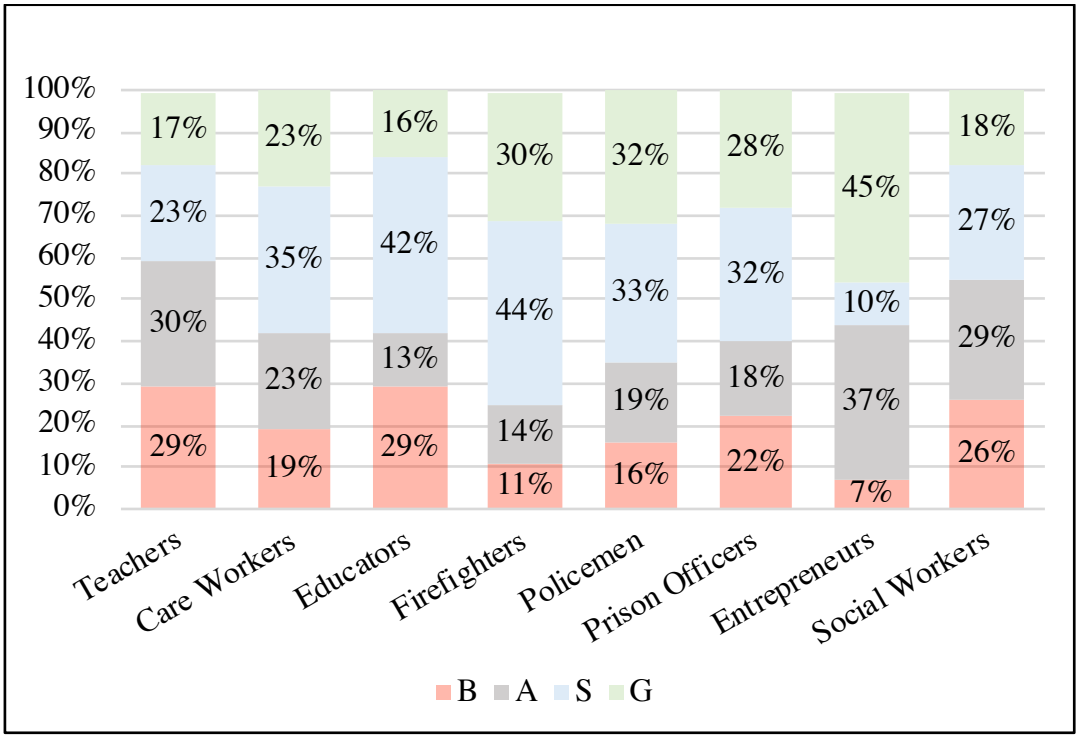
These patterns are divided into four behavioral pattern types - pattern type *Gesund* (healthy, G), pattern *Schutz* (conservation, S), pattern type *Ausbrenne*n (overextension, A) and pattern type *Burnout* (burnout-syndrome, B)(Schaarschmidt, 2004).

Despite eleven other complex characteristics, the Type *G* can be mainly defined as a pattern with a high degree of job commitment, high resilience and job/general life satisfaction but with a medium degree of overspending willingness.

The pattern *S* is described as a behavior with a low degree of job commitment and a low degree of overspending willingness but with middle resilience and job/general life satisfaction. The pattern of overextension *A*, is characterized by a very high degree of job commitment, lower resilience and job/general life satisfaction but with a very high degree of overspending willingness. The most concerning pattern is described by the type *B*. Teachers, who often exhibit this pattern, have low job commitment and very low resilience and job/general life satisfaction and a low degree of overspending willingness. While the behavioral pattern types *G* and *S* are considered to show healthy work related behavior, the patterns *A* and *B* reflecting unhealthy and critical work place behavior (Schaarschmidt & Fischer, 2013).

The distribution of the four patterns shown for different professions can be seen in Figure 2. According to the author, the numbers are not always 100% due to mathematical rounding.

Figure 2: AVEM by profession; modified based on (Schaarschmidt, 2004, 105)



With reference to this graph, teaching professionals in Germany have the highest amount of unhealthy work-related behavior compared to other work fields in this study. Overextension at the workplace and symptoms of burn-out represent were present in 59% of the teaching personals. Only 17% of the teaching staff were healthy.

Additional analyses of the AVEM distribution among teachers by gender showed that female teachers show even more concerning patterns (*G*: 7%, *S*: 26%, *A*: 26%, *B*: 41%) than male teachers (*G*: 20%, *S*: 28%, *A*: 26%, *B*:25%). Still considering that the mental health burden in general is significantly greater for females, the results are severe in both gender groups. An appearance of burnout symptoms in female teachers of 41% and in male teachers of 25% speaks for itself (Schaarschmidt, 2004).

In summary, the results are alarming in many ways. "The affected teachers [have] a decreased quality of life and [are] often no longer able to fulfill the professional demands" (Paulus 2008, 16). This circumstance has also adverse effects on the students and the society in total. As a "knowledge society" education is an elementary good and a valuable resource. Therefore, our system needs good and functional schools. Our school cannot work well without "healthy, capable and well-educated teachers" (Paulus, 2008, 16).

Further, if an imbalance between demands and resources exist, there must be intervention to regain the balance (Lange, 2004). Being capable of overcoming imbalances in work demands and resources is important skill for being psychologically robust and moreover, being a healthy worker (Goetze, 2013).

Based on this, the psychological resilience will be briefly descried in the next chapter.

2.4 Resilience

Resilient workers recover faster from psychological strains and show a higher life and job satisfaction. They are also more adaptive to changes at the work places, having a better physical and psychological health and are able to work in high performance (Goetze, 2013)(Gatchel & Schultz, 2012)(Rice & Liu, 2016).

2.4.1 Concept

The concept of resilience can be seen as a dynamic system and process in adaption on demands with an result of an either negative development or a positive development (Southwick, Bonanno, Masten, Panter-Brick, & Yehuda, 2014). It is the final product of demanding circumstances and personal resources.

Examples for teaching professional demands and general individual resources have already been given. But in the explicit context of resilience, the accountant factors for resilience are: emotional stability, cognitive abilities, fitness, motivation and social skills. All of them can be either work as risk factors or protective factors (Goetze, 2013).

The concept of resilience gains also more importance in Human Resources Management. A variety of strategies and models for promoting the resilience of employees exist, for instance the *Seven Pillars Of Resilience* or by Reivich and Shatte, or the *Pennsylvania Resilience Program* by Seligman. Further, the free market is bringing forth freelancers and coaches in this field who are publishing popular scientific literature. This is a trend which has to be handled with caution since the huge amount of models can bring methodological flaws, which will be further explained later.

Due to the limited scope of this study the strategies will not be explained in detail here. But it can be summarized what they basically have in common. That is providing different steps to overcome a demanding situation at work. For example, being aware of the stressful situation, doing emotional coping by acceptance of the demanding situation or by seeking emotional distance and further finding a solution for it (Goetze, 2013).

2.4.2 Definition

According to the American Psychological Association (2018), resilience is defined as the following:

“Resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress — such as family and relationship problems, serious health problems or workplace and financial stressors. It means "bouncing back" from difficult experiences.”

In other words, a resilient person is characterized by having the ability of positive adaption referring a risk or adversity (Luthar, 2003, 4).

Literature states that resilience can be increased by training, coaching or self-coaching (Goetze, 2013). A positive adaption might be reached by having enough coping resources due to self-regulation training. In this case, self-regulation improvement can help to develop calmness and to recognize and reduce automatic negative behavior patterns. Among others, it can be trained by relaxation techniques for reducing stress, or doing meditation for increasing the mind and body awareness (Ott, 2012).

2.5 Mindfulness

In the context of mental health, the construct of mindfulness can be used as an instrument to influence psychological well-being and health (Keng, Smoski, & Robins, 2011).

Today, mindfulness had become a popular term and the concept enjoys increased acceptance and usage in medicine and psychology (Grossman, 2008). Therefore, further explanations about the definition and the concepts of mindfulness shall be given here.

2.5.1 Concept

First, at this point it is important to outline that two existing concept of mindfulness (Rupprecht, 2014) exist. One the one hand, there is an approximately 2500 years old construct which has its roots in Buddhism. On the other hand, there is a 30 years old model, strongly influenced by the work and conceptual thoughts of Jon Kabat-Zinn (Rupprecht, 2014).

These two models differ in some characteristics (Keng et al., 2011) and will be further explained in the next sections.

2.5.1.1 Buddhist construct

With a closer look in the history of the mindfulness it becomes clear that mindfulness is not a patented term or concept (Zimmermann, Spitz, & Schmidt, 2012). Going back to the early phase of the mindfulness construct, it can be stated that it is part of old cultural tradition of the Buddhist religion. It is an important part of it. The Buddhist literature converged from different languages like the liturgical language Pāli or still spoken languages like Chinese or Japanese (Zimmermann et al., 2012).

According to the literature, the tradition of Theravāda-Buddhism developed approximately in the 7th Century after the death of Buddha. In this traditional understanding, people have to develop and live three different abilities:

1st: an ongoing development of ethical behavior (Pasīla)

2nd: reaching a calm state of deep meditative concentration (Pa samatha)

3rd: experiencing the insight nature of reality (Pa vipassanā)

If this can be implemented than it is possible to overcome the burdens of life like sadness, hurting or grief and getting back to the right path to reach the desired Nirvana (Wallace, 2012). The goal is it to reach "liberation from suffering"(Keng et al., 2011, 3).

In other words, the practice of mindfulness is needed to get to the intended final state of liberation. There is a differentiation between four different objects, or four foundations, on which the mindfulness should be focused and practiced. More specifically, the four foundations of the mindfulness practice are described as the application of mindfulness on:

1st: the body

2nd: the emotions

3rd: the mind

4th: other phenomena

The usage of mindfulness in these four ways is intended to identify that mental factors which are blocking the path of liberation and to reduce the ones which hinder the way for spiritual growth (Wallace, 2012).

Wallace (2012) stated that this includes more than just the reduction of stress in the context of emotion regulation management when having unsatisfactory life circumstances. The practice of mindfulness can also develop a sense of empathy for others and pure happiness in order to have a meaningful life.

For practicing mindfulness, a stable and calm mind is needed. Mindfulness can be practiced and cultivated by meditation. Thus, meditation is the core of mindfulness which can be seen as training of the mind. The objective is it to gain awareness over one´s own acquired habits and automatic behavior patterns (Rupprecht, 2014). A detailed explanation about different meditation techniques or further specification of spiritual practices in the Buddhist tradition will be excluded here, because it would not contribute to the aim of this study.

According to Grossman (2008), the Buddhist model is the foundation of other mindfulness models in the western society.

2.5.1.2 Western construct

One of the pioneers on the field of mindfulness in the western-based mindfulness model is Jon Kabat Zinn. He assumed that the practice of mindfulness could be also beneficial to the society of the western world (Baer, 2003). According to Knuf and Hammer (2013), Kabat-Zinn was able to separate mindfulness from the Buddhist construct. Out of his own experiences with Buddhist meditation, he developed and established a secular application of mindfulness in the clinical setting (Hayes, Follette, & Linehan, 2012). The term secular or secularism can be understood as a spiritual separation from the traditional religious context (Gooch, 2014).

In the late 70´s, he treated patients with physically chronic conditions. He focused on the group of patients where the ordinary treatment for pain reduction did not succeed. Together with a team from the University of Massachusetts he conceptualized an eight-weeks-program for cultivating mindfulness and was convinced that people can influence their management of physical and mental health conditions or other negative circumstances. He believed patients should become more empowered and self-responsible with reference to their health situation (Aßmann, 2012). This method turned out to bring positive outcomes for people with chronic pain (Kabat-Zinn, 2003). Participants reported a higher quality of life and better sleep behavior. This eight-week-course is called *Mindfulness-Based Stress Reduction* (MBSR) and now belongs to one of the popular and intensively researched programs (Ott, 2010).

In this program also information about meditation, examples of mediation practices, exercises for stress reduction, information exchange about stress and other negative experiences were assembled into a curriculum. Today, this curriculum is only minimal edited and still used (Aßmann, 2012). Referring to the limited extent of this study, no further details to the contents will be discussed here.

Aßmann (2012) highlighted, that even if the MBSR-curriculum was originally designed for people with chronic diseases it rather can be understood as an education program than a clinical intervention. But apart from that, the curriculum was also further modified for the clinical use referring the treatment of several disorders like stress-related medical disorders including fibromyalgia and psoriasis, borderline personality disorders, eating disorders or major depressive disorders (Baer, 2003). Meanwhile, MBSR training is used in over 250 clinics in North America and Europe (Knuf & Hammer, 2013).

Anyways, in Germany many health insurances support, fund or co-fund it as a preventive measure. It can be suitable for all people who seek for a health-promotion in coping with: difficult or burdening circumstances, negative feelings and emotions and an imbalance of awareness in life (Aßmann, 2012).

The different mindfulness constructs can be seen as a part of a conceptual discourse of mindfulness which grew over centuries: the complexity can lead to “confusion”(Keng et al., 2011,42).

For clarification, some definitions and insights in the discourse of the mindfulness construct will be given now.

2.5.2 Definition

In everyday language, the term mindfulness may be used in a similar way as the word *vigilance* and therefore could be interpreted as a term with characteristics of an expression like *being careful*. But apart from that, in science different meanings exist (Rupprecht, 2014).

In the field of mindfulness research, there is no universal or "correct" definition (Wallace 2012, 21). The author underlined that we might have to bear in mind that in no language a word got invented out of itself. Words get loaded with meaning due to their placement within the society and its context.

An often used and well-known one is the definition from Jon Kabat-Zinn (Keng et al., 2011).

"Mindfulness is the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, 145).

Another one was described by Baer (2003, 125) defining mindfulness as a "nonjudgmental observation of the ongoing stream of internal and external stimuli as they arise."

Keng et al.stated 2011, that some researchers focus only on the awareness part in their definition of mindfulness. Others do include additional components like self- experience or self-regulation.

Referring the focus of this study, only definitions of the western construct were given here. But it also has to be mentioned, that the development of the mindfulness concept over centuries and a lack of a common or overall clear definition of the term mindfulness itself led to "the presence of different interpretations of mindfulness" (Hyland, 2016, 98). A circumstance which had to be considered by trying to operationalize mindfulness. Therefore, the discourse will be briefly described.

2.5.2.1 Discourse about the mindfulness definition

In defining mindfulness, diverse opinions about the inclusion of different dimensions of mindfulness exist. One special point of the discussion is the interpretation of awareness.

From the Buddhist perspective, mindfulness focuses on an "introspective awareness with regard to one´s physical and psychological processes and expectances" (Keng et al., 2011, 3). On the other hand, the western perspective explains that mindfulness includes internal and external awareness. Moreover, experiences from external sensors like smells and sights would be a part of awareness too (Keng et al., 2011).

Some advocates of the traditional concept even claim the separation of mindfulness from the Buddhist traditions brings a strong contradiction and bias into the understanding and experience of mindfulness (Chiesa, 2013). They claim that modern psychologists idealize their western concept of mindfulness, since it cannot be possible to precisely exclude traditions and ethical values (Wallace, 2012).

Representatives from the western construct argue that due to secularism the mindfulness is freed from unnecessary cultural burden and only the true core of it is left. Additionally, they underline that results from science and research demonstrate that the western construct of mindfulness is measurable and can cause positive effects on health outcomes (Gethin, 2012).

2.5.3 Mindfulness in education

In the educational setting of schools we have limited information about the usage and the influence of mindfulness. This refers to the use and effects on students as well as to the influence on teaching professionals (Elsholz & Keuffer, 2012).

With respect to the students' perspective the mindfulness practice has been seen critically among education researchers so far (Elsholz & Keuffer, 2012). With focus on the German education system, the skepticism has reasonable roots. In European history, education was connected with religion and theology over centuries. The separation of church and state brought a new order. Consequently, education became the task of the government. Except for the religious lessons, theories on education advise that education in schools should be taught using a neutral world view without any ideology or religious belief systems.

Today in Germany, education is under state supervision according to the German Constitution. The state shares responsibilities with the German federal states. Consequently, federal states and federal city states have an official educational mandate for Schools and Universities. As an example: according to article two of the *Hamburg School Law* (Hamburgisches Schulgesetz), schools have an educational mandate (Behörde für Schule und Berufsbildung, 2009).

For instance, in this mandate it is written that Schools have the task promote the student's skills with regards to promote their:

- relationship skills towards social cohabitation for skills like tolerance, respect and fairness
- awareness of one´s own physical and mental well-being
- ability of recognizing physical and mental well-being of others

Additionally, the school lessons must set up in a way that aims like unfolding personality, physical and social capabilities (self-responsibility, decision making, coping with conflicts or communication skills) can be reached (Behörde für Schule und Berufsbildung, 2009). Still, in many schools rather the teaching of only analytical, rational knowledge in schools owns highest acceptance (Kaltwasser, 2012).

However, it can be stated that schools have a clear responsibility regarding the personal and social development by shaping childhood and adolescence. But within this system, "teachers are arguably the most important agents" (Beshai, McAlpine, Weare, & Kuyken, 2016, 1).

Despite of the knowledge transmission, the teacher's role is it to influence the student's educational outcome in the context of the described educational aims (Kaltwasser, 2016)(Elsholz & Keuffer, 2012).

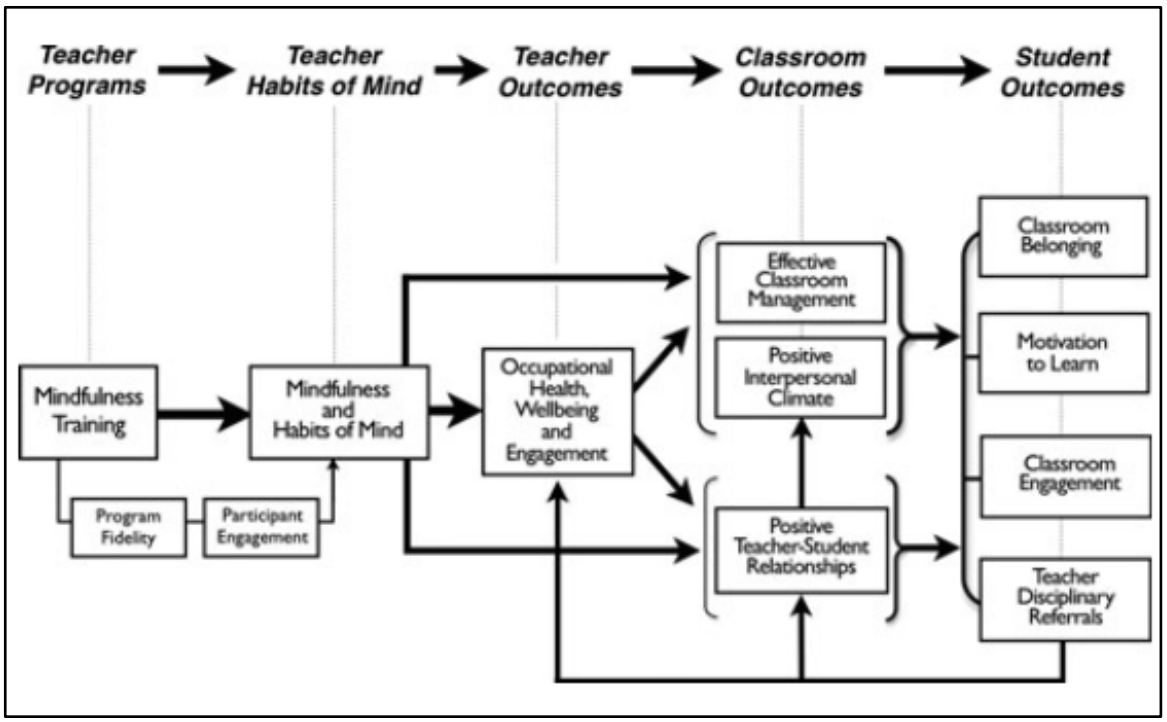
Because mindfulness based education is associated with positive outcomes on a well-being, social and emotional competences in school children, it could be a tool to support this educational mandate (Schonert-Reichl et al., 2015).

But according to Elsholz & Keuffer (2012) the students only get access and are able to experience mindfulness if the teaching professional is mindful himself or herself.

Studies have shown that mindfulness is taught most effectively if the teacher embodies a mindfulness attitude (Jennings et al., 2017). The teacher has to be mindful first before they might be able to teach mindfulness. Consequently, mindfulness training for teaching professionals would be necessary to advance this skill in students (Elsholz & Keuffer, 2012)(Kaltwasser, 2012). Despite this teach-the-teacher argument a positive outcome for the teacher itself could also be possible (Harris et al., 2016).

Roeser et al.(2012) showed a one Logic Model which underlines one possible chain of effects from a mindfulness training of teachers in a school setting.

Figure 3: Logic Model of effect chain in school setting by (Roeser et al., 2012)



In summary, mindfulness teachers are the key for transmitting mindfulness (Elsholz & Keuffer, 2012).

Also as described earlier, the health status of teachers referring mental health outcomes for teachers like the high number of burn-out cases are concerning (Schaarschmidt & Fischer, 2013)(Howard & Johnson, 2004). But as figure 3 already implies, mindfulness training could be used as a measure to promote the well-being and health of teaching professionals too (Roeser et al., 2012)(Jennings, 2016)(Harris et al., 2016).

Referring to the employers' duty of care and the need for health intervention for teaching professionals this could be an opportunity for employers to straighten inner resources like the psychological resilience of teachers in line with the Systemic Demands-Resources Model.

The current state of research on this topic will be presented and discussed in the next section.

2.6 Current state of research

A search was compiled using the terms mindfulness, resilience, teacher, teaching professionals, school, occupational health by using the Pubmed, Psychmed and ZPID databases. Here the main focus was on systematic reviews of the influence of mindfulness on resilience occupational health or in teaching professionals.

After studies on this field were found a second search was performed for identifying instruments on resilience, mindfulness and studies reporting the psychometric development of these instruments.

Results show that mindfulness has been theoretically and empirical proven to be associated with physical and psychological well-being. Studies about this can be mostly found in the clinical field where for instance MBRS is used in training set ups or in psychological therapy. But Keng et al. (2011) stated in their review on empirical studies about the effects of mindfulness on mental health that the focus is often on only physical effects. Also, studies were often uncontrolled. Baer (2003) even talked about “methodological flaws”. Further, the “interventions all involve multiple components” which would have to be better untangled to better examine the effects (Keng et al. 2011).

Focusing on resilience as an outcome parameter research is rare. The systematic review of Joyce et al. (2018) was searching and analyzing cognitive based trainings, mindfulness trainings, and trainings with a mix of both approaches which were focused on improving resilience as an outcome. Out of 427 findings only 17 studies met the actual topic and the quality criteria. The authors could only find 5 studies focusing on exclusively mindfulness trainings and resilience. Out of them only 2 met the quality criteria and were included. The combination of cognitive and mindfulness-based intervention appeared to have a positive impact on resilience and the review also “demonstrates the lack of currently available evidence”. Further, it also underlined the particular relevance of mindfulness and resilience in high risk work forces (Joyce et al., 2018, 7).

Focusing on mindfulness at the workplace the results are as follows. Some studies provide research about the improvement of mental health outcomes but in social workers, care workers or the military (Rice & Liu, 2016)(Mallak, 2016). For identifying the influence of mindfulness on health outcomes in occupation we need " […] more research in the work settings" (Mallak, 2016, 237). Less is known about training effects in other professions and about the influence of mindfulness on resilience at work.

In the occupational setting Kersemaekers et al. (2018,1) reported in their study that the offers for workplace mindfulness trainings do increase but that on the other hand "there is limited research on the effectiveness of mindfulness interventions in workplace settings." In their study they involved different companies and trained 425 employers in mindfulness training but also did not have a control group. Anyways, results in the occupational setting for instance were a significant increase in mindfulness, life-satisfaction, sense of autonomy, self-regulation, and a reduction of stress, or cognitive diffusion in leadership (Spence, 2017)(Reb, Narayanan, & Chaturvedi, 2014). Mindfulness training at the workplace is also linked to a lower emotional exhaustion (Kersemaekers et al., 2018). Papers about the impact of mindfulness on specifically resilience as an outcome in the occupational setting weren't identified.

In the context of the educational setting, studies tend to be focused on students or university students performance and health than on teaching professionals when it comes to mindfulness (Volanen et al., 2016)(Galante et al., 2018).

Roeser et al. (2012) listed different school based mindfulness interventions and declared that some of them also include the teachers' mindfulness but that more evaluation and research on the effects in these programs is needed., especially when it comes to the outcome effects, the effectiveness and efficacy of such programs (Roeser et al., 2012). Examples or comprehensive work are the following. For teaching professionals reported Harris et al.(2016) results of a daily brief school based yoga and mindfulness intervention to promote educators (n=64) in health and stress-management. Results were significant for mindfulness, class-room management, distress tolerance and physical symptoms. Effect sized for sign. Results reached from 0.52 to 0.80. No impact was identified for perceived stress and sleep. The non-randomized trial from Beshai et al.(2016) involved seven schools in England with a total of 108 participants and found that mindfulness-based intervention can reduce significantly teachers stress.

Researching resilience as an outcome, the program for Cultivating Awareness and Resilience in Education (CARE for teachers) had been identified according to the search criteria (Jennings, Frank, Snowberg, Coccia, & Greenberg, 2013). CARE was conceptualized by the University of Virginia in the United States of America (U.S.A.) as a professional development program designed to promote the emotional and social competences on teachers. The 244 teachers were recruited form elementary schools. Results state significant positive effects in mindfulness, emotion, regulation, and stress. (Jennings et al., 2017). Even though the title of the program includes resilience measurement the study rather focusses on outcomes like emotion regulation, physical and psychological distress and teaching efficacy. As explained in the background earlier, these can rather be considered as accountant resources or preventive factors which can lead to resilience. Resilience itself neither is directly measured as an outcome nor was it analyzed with a tool for resilience scale measurement.

Focusing on Germany and narrowing it down, a non-randomized waitlist-control study of Rupprecht, Paulus, & Walach(2017) investigated the impact of MBSR-intervention on teachers well-being at the city state Hamburg (n=32). Results were that teachers with mindfulness intervention had greater mindfulness scores in mindfulness presence and mindfulness acceptance (separate factor-scale scores) and also reported positive effects on the teachers' well-being. Apart from that, a study about mindfulness intervention and its effect on the teaching professionals' resilience level could not be identified in this search.

Based on this knowledge, this research has the following research question as stated in the next chapter.

2.7 Research question

The aim of this study was to identify the effect of the mindfulness training with reference to possible improvements of the mindfulness and resilience level in teaching professionals.

For gaining more quality in the research this supposed to be organized in a way where a group of people got a mindfulness intervention in comparison to people who did not get a mindfulness intervention. Consequently, the following research question and hypothesis were conducted:

Research Question: Does a mindfulness training sustainably improve the mindfulness and resilience level in teaching professionals?

For each of the following hypothesis H0 exist which would represent no effect.

The alternative hypotheses are:

H1: Mindfulness positively *influences* the resilience of teaching professionals.

H2: Participants of the mindfulness training have a higher *mindfulness level* than the participants of the control group.

H3: Participants of the mindfulness training have a higher *resilience level* than the participants of the control group.

In the next chapter, the placement of the study, the research design, data collection and analyses will be further explained.

3 Method

First, the mindfulness project will be described as it the basis of this research.

3.1 Project

The employer for all teaching professionals in schools at the federal city state Hamburg is the official school authority, called *Behörde für Schule und Berufsbildung* (BSB). With reference to the *Arbeitsschutzgesetz* (German Occupational Safety and Health Act, ArbSchG) it must ensure the safety and health of all teachers in Hamburg and needs to keep the physiological and psychological risks low or even eliminate them (Gesetzliche Unfallversicherung, 2013). The BSB has different sub-institutions and measures to fulfill the employer's duties of care. More detailed, the task of health related- services for employees belongs to the state sub-authority *Landesinstitut für Lehrerbildung und Schulentwicklung Hamburg* (Li), which can be translated as the State Institute of Teachers Education and School development Hamburg.

According to its policy the Li defines itself as service center that qualifies teaching professionals in contributing to the teachers' development of job profession by focusing on an unfoldment of personal, professional and pedagogical competences. It also supports the schools of Hamburg in an ongoing development of the quality in education

With reference to teachers' health, the Li offers a wide range of services in the context of health prevention and consulting. Areas of services are for instance the support in planning, implementing and evaluating intervention measures in schools or consultant services in the setting of crisis management. The Li also promotes the concept of good healthy schools (Landesinstitut für Lehrerbildung und Schulentwicklung, 2016). Broader information's about the services will left out due to the focus of this study.

With reference to occupational health promotion the Li offers a training project called *Achtsamkeit in Schule* which can be translated as Mindfulness in Schools.

Referring to internal papers, this training aims to support personality development, promote the resilience, and reduce the mental health work strain and to impart competencies of having a mindful attitude in everyday school life.

The target group was active teaching professionals from Hamburg who were interested in this training.

The training concept was divided into two phases. The first phase focused on the development of basic competences of a mindful attitude. Theoretical basic knowledge was placed. Additional, basic mindfulness exercises were practiced. In the second phase, participants had to deepen and intensify their own mindfulness skills. Further they should learn how to pass on their knowledge to their students in the schools and during school lectures. A more detailed overview of the phases, timespans and contents of the mindfulness project is given by the following figure.

Figure 4: Mindfulness in Schools – Project Overview

Time frame:	**Project Overview:**
	first phase
09/2014 - 12/2017	Basis Modules: 1. Mindfulness - A Theoretical Framework (5 meetings) 2. Mindfulness Based Stress Reduction (4 meetings)
	Deepening Modules: 1. in-depth mindfulness and awareness (1 meeting) 2. Personality, Presence, Mindfulness in Teaching Professions (2 meetings) 3. Self-responsibility and Self-efficacy (2 meetings)
	Additional Module: 1. Communicational exchange and Individual Coaching (demand depending)
	second phase
01/2017 - 02/2018	First Module: 1. deepen theoretical Framework, mindfulness as a part of school culture, self-regulation and impulse control, top-down emotion regulation (2 meetings)
	Second Module: 1. communication with co-workers, students, school director; implementing mindfulness with low-threshold accessibility in everyday school lessons (2 meetings)
	Third Module: 1. self-reflection and inner attitude of teachers, exercises, how to motivate students for mindfulness training (2 meetings)
	Follow-up Module: 1. feed-back process, reflection and final conclusions, current state of own mindfulness attitude and implementation in school process (1 meeting)

The first phase included six training modules. The modules were spread over one school year. This first phase started in September 2014. Till December 2017 three groups of participants got this training (one group each year).

In December 2017, all participants of the first phase (n=44) got an invitation for an information event referring the opportunity to participate on the second phase of the program. The teachers who came to the event (n=22) got information about contents and requirements for participation. If they still were interested, teachers had to sign in for the second phase via a paper form (n=19). On this form they also had to agree to the necessary requirements.

In detail, participants had to fulfill the following conditions according to internal papers:

- participation of the first phase of the project
- having knowledge about the theoretical background of mindfulness
- willingness to deepen own knowledge and experience of mindfulness
- willingness to implement mindfulness in schools and working with a specific class of students (class from primary and secondary school grade), handing out information to parents, co-workers and school directors regarding the project
- willingness to build groups among colleagues for experience exchange
- willingness to contribute in process documentation and evaluation.

The participants for the second phase got selected by the Li with regard to the requirements.

Based on the second phase of project the study design was planned.

3.2 Study design

With regard to the already existing mindfulness project the study set up had to follow towards the characteristics of this mindfulness project. This present study used a non-randomized intervention design with one intervention group and one control group and two time points of measurement.

This study is prospective. Since the mindfulness intervention already started in 2014, the first time point of measurement (t1) in the intervention group was the last day of mindfulness training [October 6th, 2017]. This was the earliest study entry point.

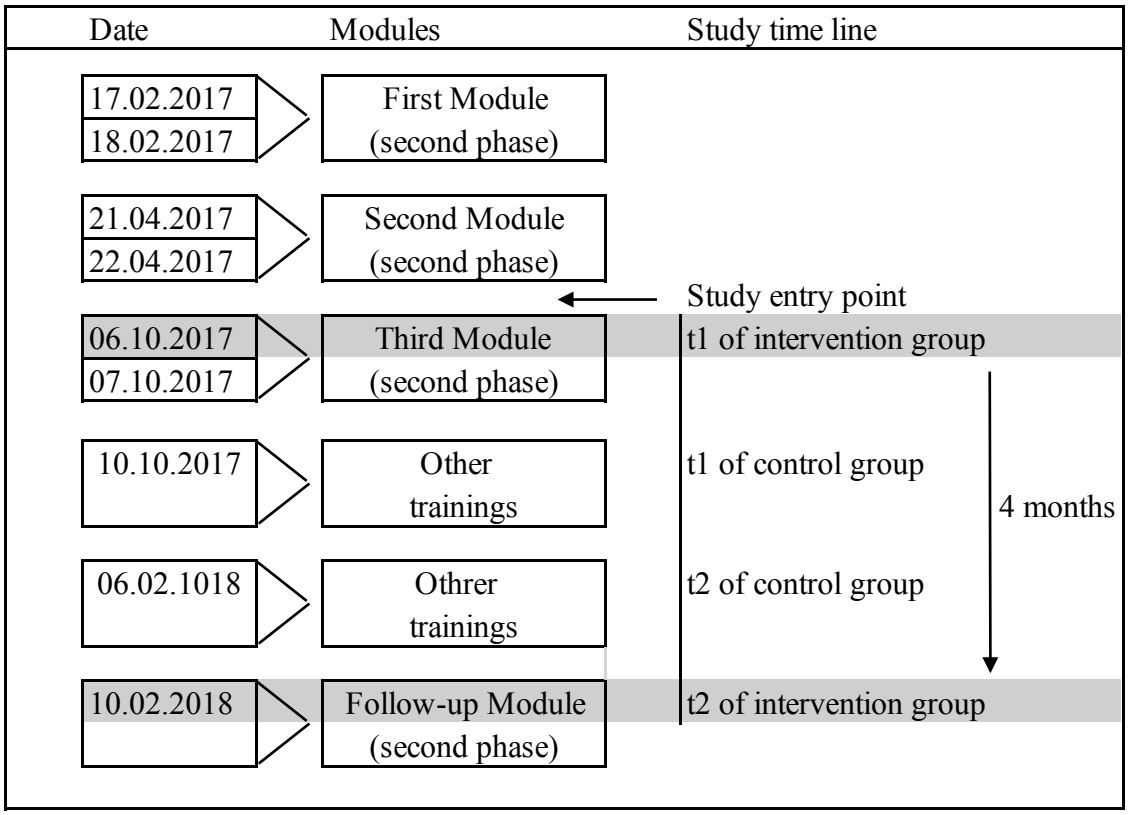
As a consequence, a randomization for this study was not possible. For identifying whether there are stable and sustainable results over time, a second time point (t2) was set up after 4 months of the last intervention [February 10th, 2018]. Time point t2 was at the follow up meeting.

For the control group t1 [October 10th, 2017] and t2 [February 6th, 2018] were scheduled as a part of regular trainings with other training content.

The participants were recruited from trainings at the Li. All teaching professionals who participated in the two-years mindfulness training offered by the Li were the intervention group. Including criteria went alongside with the participation criteria of the application proses of the Li. In particular, participants had to be active teaching professionals in public schools of the city state Hamburg and had to complete phase 1 of the mindfulness program first.

Due to the fact that the mindfulness intervention has a fixed group of participants with ongoing trainings, a control group with similar characteristics had to be found. Further, this was necessary for having a comparable group of people and similar external conditions at the data collection. The control group were teaching professionals who used other Li- based training services with different educational content. Therefore, ongoing trainings without health-relational contents were required. Further, training must have had a constant group of participants taking place in a similar time period. For better transparency, an organizational chart of the study planning is given in figure 5.

Figure5: Planned study organization



3.3 Data collection

Data were collected by using a quantitative approach. The same questionnaire was used at time point one and time point two. Participants were asked to fill the paper-version of the questionnaire at the beginning or during the breaks of the training. Colleting the data directly at training was organized because the willingness to participate and moreover the respond rate was expected to be higher. Therefore, a low-threshold excess and uncomplicated response mechanisms were aimed for keeping motivation of participation as high as possible.

Further, a short and less time-consuming questionnaire was desired. Participants got information about the study via email in advance and over their training instructors. Additionally, personal support was given by moving into the training classes and explaining the process, answering questions and collecting the questionnaires.

To increase compliance, participants were offered an anonymized feedback report. Additionally, free participation on a local teachers' health summit was offered as a reimbursement for their participation in the research.

Since the mindfulness project already started the need of a sample size calculation was not given in this study. But in order to have higher quality in the data set up an unbalanced sample size design was selected. Here, the number of participants in the control group is higher than the number of participants in the intervention group.

Due to organizational and practical restraints, only two trainings met the criteria for being recruited as a control. The control group participants had training on strengthening intercultural competencies or gaining knowledge about either methods in physics or intercultural competences. Additionally, as a result of some changes in the Li´s internal training agenda among the control group for t1 and among the intervention group for t2, participants had to receive the questionnaires via electronic mail for these specific dates. They could either return it in digital form (via email) or in paper form (via envelope).

Consequently, limited data are available, especially among the controls for t1.

3.4 Instrument

To operationalize the mindfulness and resilience the instruments that were used will be introduced.

3.4.1 Resilience

The resilience was measured with a standardized questionnaire to identify the individual degree of resilience.

Methodological reviews analyzed different resilience measurement scales (Ahern, Kiehl, Lou Sole, & Byers, 2006)(Windle, Bennett, & Noyes, 2011).In these studies a comparison between the different instruments had been made. Apart from other measurement scales, both studies mainly focus on six instruments. These are the *Baruth Protective Factors Inventory* (BPFI), the *Connor–Davidson Resilience Scale* (CD-Risk), the *Resilience Scale for Adults* (RSA), the *Adolescence Resilience Scale* (ARS), the *Brief-Resilient Coping Scale* (BRCS) and the *Resilience Scale* (RS).

In both reviews the RS reached good values in the quality assessment. According to (Windle et al., 2011) the RS scored an overall high quality like most of the instruments did. In their quality ranking from 0 to 18 the RS scored a value of 6 (highest value of this study was 7).

With reference to the analyses of (Ahern et al., 2006, 103) the RS was "the best instrument to study resilience […] due to psychometric properties of the instrument and applications in a variety of age groups […]." Further, the RS was developed in 1993. Since then it has been used and tested in a wide range of study populations for divers individuals with different socioeconomic and educational backgrounds (Wagnild, 2009).

The RS has a 25-items scale and two factors called *Personal Competence* and *Acceptance of Self and Life* (Ahern et al., 2006). But the two-dimensional structure of the instrument was not transferable appropriately into a German Version. Therefore, the German researchers (Schumacher, Leppert, Gunzelmann, Strauß, & Brähler, 2005) developed a short version of the RS with an 11-items unidimensional scale (RS-11) (Röhrig, Schleußner, Brix, & Strauß, 2006). Items of the short version still cover both dimensions (Schumacher et al., 2005).

The instrument has a seven-point rating system of answering options. The rating ranges from the lowest value of 1 to the highest value of 7. Endpoints are “disagree” for the lowest value and “agree” for the highest (Schumacher et al., 2005, 169). A high value corresponds with a high resilience (Röhrig et al., 2006).

According to (Röhrig et al., 2006, 17) studies shown that the RS-11 is a reliable and valid tool: “that allows an economic assessment of resilience.” For an acceptable quality of the study the reliability of the resilience score instrument should be higher than the value of 0,7 of Cronbach`s alpha(Field, 2009). While the 25-item version has a Cronbach alpha of .95, the internal consistency of the short form still has a Cronbach alpha of .91 and can be assessed as good (Schumacher et al., 2005).

Due to the already explained requests of keeping the effort for participants as low as possible, the shirt form RS-11 was used in this study.

3.4.2 Mindfulness

Related to systematic reviews found in the previously described literature research, there are different instruments in the research field measuring mindfulness of adults. The ones which provide a large amount of literature are the *Freiburg Mindfulness Inventory* (FMI) , the *Mindfulness/Mindlessness Scale* (MMS), the *Mindful Attention Awareness Scal*e (MAAS), the *Kentucky Inventory of Mindfulness Skills* (KIMS), the *Five Facet Mindfulness Questionnaire* (FFMQ), the *Philadelphia Mindfulness Scale* (PHLMS), the *Southampton Mindfulness Questionnaire* (SMQ) and the *Comprehensive Inventory of Mindfulness Experiences beta* (CHIME-ß) (Pallozzi, Wertheim, Paxton, & Ong, 2017).

These instruments differ in goal setting, definition of mindfulness itself, and whether mindfulness is measured as a state or as a trade. Therefore, they cover different facets of mindfulness (Sauer et al., 2013) (Pallozzi et al., 2017).

Among them, authors of the FMI highlight that the FMI offers a holistic construct of mindfulness in clinical and non-clinical populations (Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006) (Sauer, Walach, Offenbächer, Lynch, & Kohls, 2011). It is an instrument for measuring trade mindfulness in adulthood (Buchheld, Grossmann, &Walach, 2001). The already given definition of mindfulness from Jon Kabat-Zinn is stated to be the basis of the construction (Walach et al., 2006).

The questionnaire aims to capture trait mindfulness by four different factors or dimensions. The factors are *Mindful Presence*, *Non-judgmental Acceptance*, *Openness to Experience* and *Insight* (Walach et al., 2006). They are measured by a 30item version. But the authors also offer a short item version with 14 items (FMI-14).

The short item version is conducted as being semantically independent from the Buddhist tradition or meditation context. But in the short form mindfulness can only be measured as a general factor. Even if Rupprecht et al. (2017) still did separate factor analasis, separate analyses for different dimensions of mindfulness were not recommended by the author (Walach et al., 2009). Thus, a calculation of sub-scores is not useful.

The short item version is sensitive to change and is also recommended for participants without any pre-experience on mindfulness (Sauer et al., 2011). Therefore, it is a good fit for the control group.

Moreover, the Li, as already mentioned, desired a data collection set up with low-threshold for keeping participation and response high. Additionally, the Li already worked with FFA and the questionnaire was primarily developed in the German language because the earlier attempts of translating already existing questionnaires into the German language failed (Walach et al., 2009). Therefore, the short item version of the FMI in German language was used in this study.

While the full item version showed an internal consistency of Cronbach´s alpha = .93, the initial validation study also stated semantically robustness and psychometrically stability for the short form; Cronbach´s alpha = 0.86 (Walach et al., 2006). Other studies reproduced equal results (Sauer et al., 2011). The Likert-Scale response options of the FMI-14 range from 1 (almost never) to 4 (almost always).

3.5 Data description

Data description: The sample will be described by *age*, *sex*, *mindfulness pre-experience* and *school type*. The question about the *mindfulness pre-experience* called "How much pre-experience do you have referring the topic mindfulness or relaxation techniques (e.g. MBSR training, Yoga or Qigong)?" and had response options from 1 (none), 2 (little), 3 (some), 4 (much) to 5 (very much). Since the study could not be placed at the beginning of the intervention this question was asked for getting an approximative indicator of whether there could be a possible selection bias in the control group or not according to the pre-experience. Therefore, the assumption would be that the controls would have at least less pre-experience in mindfulness than the intervention group. The variables *teaching time* and *teaching preparation time* were required to ask by the Li and will not be discussed in this study because they are not relevant for answering the research question.

The level of mindfulness and the level of resilience will be measured by scores. The *mindfulness sum score (FMI score) and* the *resilience sum score (RS score)* are calculated for each time point of measurement. The possible range of the FMI sum score is from 14 to 56 points. For the RS sum score it is from 11 to 77 points. For identifying outliers and getting an idea about the distribution of the scores histograms were used. These scores are described by the mean, standard divination (SD) and range. Normal distribution is tested by Shapiro-Wilk test.

3.6 Data analyses

Data analyses: To test if mindfulness has an influence on resilience two linear regressions are conducted for the two time points. At first, only the mindfulness score was included, but to see if the different groups have also an influence on mindfulness and resilience, the groups were included as a second predictor. Analyses of Variances (ANOVA) have been used for testing how the mindfulness scores and the resilience scores changed how the scores differ among the intervention and control group. They were also used to test if there is a significant influence of the interaction between time and group.

In detail, the repeated measures ANOVA with one between subject factor (group) is conducted. Mauchly´s Test of Sphericity will not be computed for only two levels (in this case for two time points) and cannot be reported (Field, 2009). Therefore, a paired t-test is used to see if there is a main effect due by the time. During the research, no outlier was found and consequently all data were included in the analyses.

Data preparation: The results were computed by using the data processing software SPSS23. A *group* variable with the categories (mindfulness group=1, control group=2) was computed. With reference to the authors, item 13 of the FMI-14 had to be reversed coded (Walach et al., 2006). Therefore, the item 13 was recoded into a new variable (FFA_13_new) by using the syntax. Data was entered according to double proof reading system.

Four new variables were computed for the sum score of the FMA-14 and the sum score of the RS-11 at t1 and t2. They were composed by summing up the item values.

As sum scores are only calculated for completed questionnaires missing values had to be considered carefully. Different approaches of handling missing data exist. Some approaches, Last Observation Carried Forward or Last Observation Carried Backward, assume that there is no further improvement which can underestimate the treatment effect. This can be especially difficult in small sample sizes (Israëls, Kuyvenhoven, Laan, Pannekoek, & Nordholt, 2011). Therefore, in this study the missing values were replaced by the imputation of the predicted mean of the other items which were answered for the specific case. Here, the mean stays closer at the individual data of the affected case for each time point.

Ethics: The involvement in the study was completely voluntary. Participants were able to withdraw from the study at any time. To allow anonymity, participants were encouraged to create a unique personal code on the questionnaire. The code was built out of the first two letters of the first name of their mother, the first two letters of the first name of their father and the day of birth of the mother. Names of the participants were not needed. The study was approved referring ethical considerations by the responsible authority at the Li.

The results of this study will be reported and further clarified in the following section.

4 Results

Based on the research question and the hypotheses, this section will start with a descriptive analysis of the demographic data. After that, results of the analysis with regard towards answering the research question will be displayed.

4.1 Population description

Group: In this study 44 teaching professionals participated. Among them, 15 teaching professionals got the mindfulness intervention training and 29 pedagogues composed the control group by participating in other trainings apart from mindfulness contents. Descriptive data analyses showed that for t1 there were 11 missing participants in the control group and nobody in the intervention group. For t2 there were 3 missing participants (intervention group: n=1, control group: n=2).

Age: The average age was 47,0 years (SD=10,3 ; min=28 max=62) at t1 and 44,9 years (SD= 10,2 ; min=28, max=62) at t2. The Variance in the average age is explained by the lower number of cases among the controls at t1.

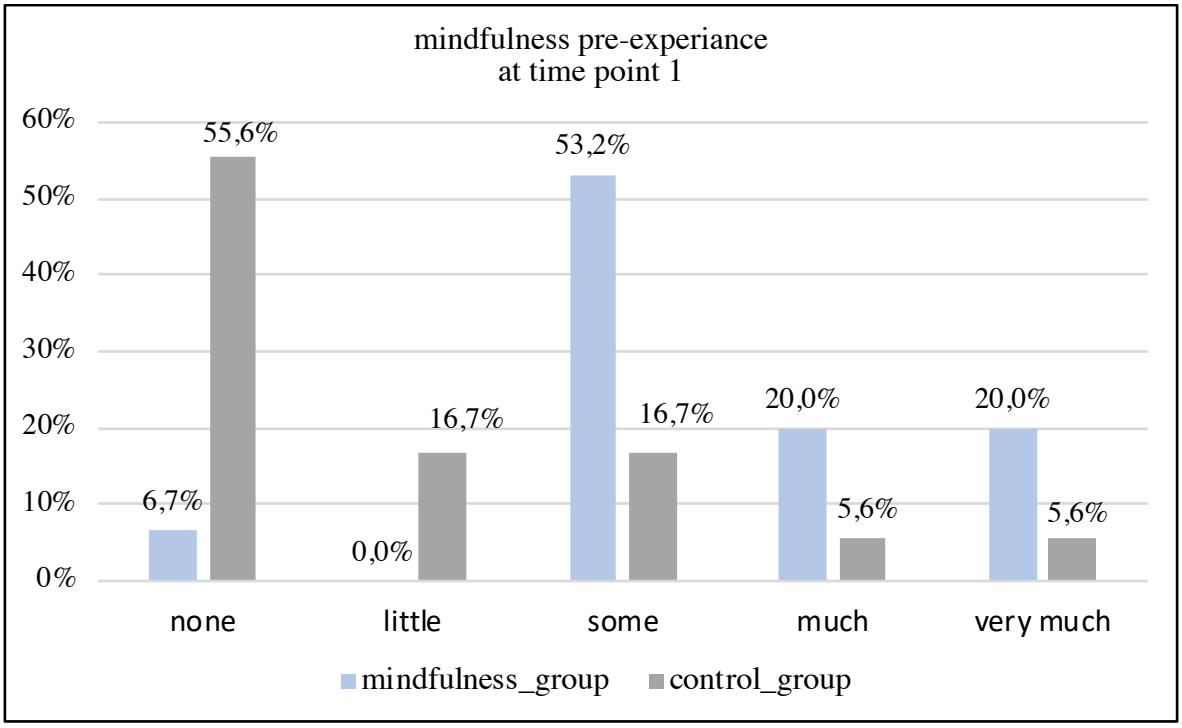
Sex: The overall gender distribution showed more female (t1: n=19 [57,6%], t2= 25 [62,5%] than male teaching professionals (t1: n=14 [42,4%], t2= 15 [37,5%]). But a detailed analyses split by groups revealed an even more heterogeneous result in the distribution for female participants (intervention group t1: n=12 [86,7%]; t2: n=12 [80,0%]; control group t1: n=6 [20,4%] ; t2: n=13 [44,8%]) and male participants (intervention group t1: n=2 [13,3%] ; t2: n=2 [13,3%]; control group at t1: n=12 [41,4%] at t2: n=13 [44,8%]). The mindfulness group had 86,7% female participants and 13,3% male participants. While in the control group only had 33,3% females but 66,7% males.

School type: The distribution for this variable presented a heterogeneous picture in the school type. The Participants worked at a variety of different schools like *Berufliche Schule* (technical school, BS), *Grundschule* (elementary school, GS), *Gymnasium* (grammar school, GYM), *Sonder-/Förderschule* (special School, FS), *Stadtteilschule* (comprehensive school, STS) . In intervention group there was a distribution of BS (n=4 [29%]), GYM (n=4 [29%]) and STS (n=4 [29%]) as being the most common answers for t1. Other school types were FS (n=1 [7%]) and GS (n=1 [7%]). At t2 the distribution was the same.

Among the controls most teaching professionals came from of STS (n=10 [56%]) followed by GYM (n=4 [22%]), BS (n=2 [11%]). The number of participants for FS (n=1 [6%]) and GS (n=1 [6%]) was the same as in the intervention group.

Mindfulness pre-experience: The question "How much pre-experience do you have referring mindfulness or relaxation techniques (e.g. MBSR training, Yoga or Qigong)?" got answered by all participants of the mindfulness group and by 18 participants of the control group for t1. Since pre-experience is only a reasonable issue at the study entry point the figure 6 displays the distribution of the participants pre-experience in percentage with regard to the first time point. Bars are displayed for mindfulness and control group.

Figure 6: mindfulness pre-experience between groups at time point 1



This figure displays that answering option “some” was the most frequent among the intervention group (n=8 [53,2%]). Since pre-experience and knowledge about mindfulness was a requirement for entering the second phase of the project for the mindfulness group, most of the participants in the intervention group have pre-experience. Only one participant answered with “none” pre-experience. This might be an error in understanding the question correctly.

The majority of the control group had none (n= 10 [55,6%]) or only little (n= 3 [16,7%]) pre-experience in mindfulness. This result met the studies pre-expectation of less pre-experience in the control group compared to the intervention group.

Still, it had to be admitted, that a considerable number of controls already came in touch with mindfulness or its practice. Here, 11,2% had even much and very much pre-experience.

Score distribution: The descriptive results of the sum scores were described and displayed in the following modified SPPS table.

Table 1: Descriptive results for mindfulness and resilience scores at t1 and t2

Descriptive Statistics

	N	Range	Min	Max	Mean		SD	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
FMI_SCORE_1	33	18,00	33,00	51,00	39,8182	,78872	4,53083	20,528
FMI_SCORE_2	41	19,00	31,00	50,00	40,5366	,68083	4,35946	19,005
RS_SCORE_1	33	24,00	49,00	73,00	60,9394	1,10520	6,34891	40,309
RS_SCORE_2	41	25,00	47,00	72,00	62,0244	,90358	5,78571	33,474
Valid N (listwise)	30							

For t2 the FMI score was 0,72 points higher (M=40,54, SD=4,36) than for t1 (M=39,82, SD=4,53). Also, in resilience score there was an increase by 1,08 points from t1 (M=60,94, SD=6,35) to t2 (M=62,02, SD=5,79). With a closer look into the results, the sum scores were distributed in the following way as the Histograms will show in figure 7 to Figure 10. Here Histograms were the chosen graphic type because they are appropriate form of presentation according to the data quality level.

Figure 7: Histogram of the mindfulness sum score at time point 1

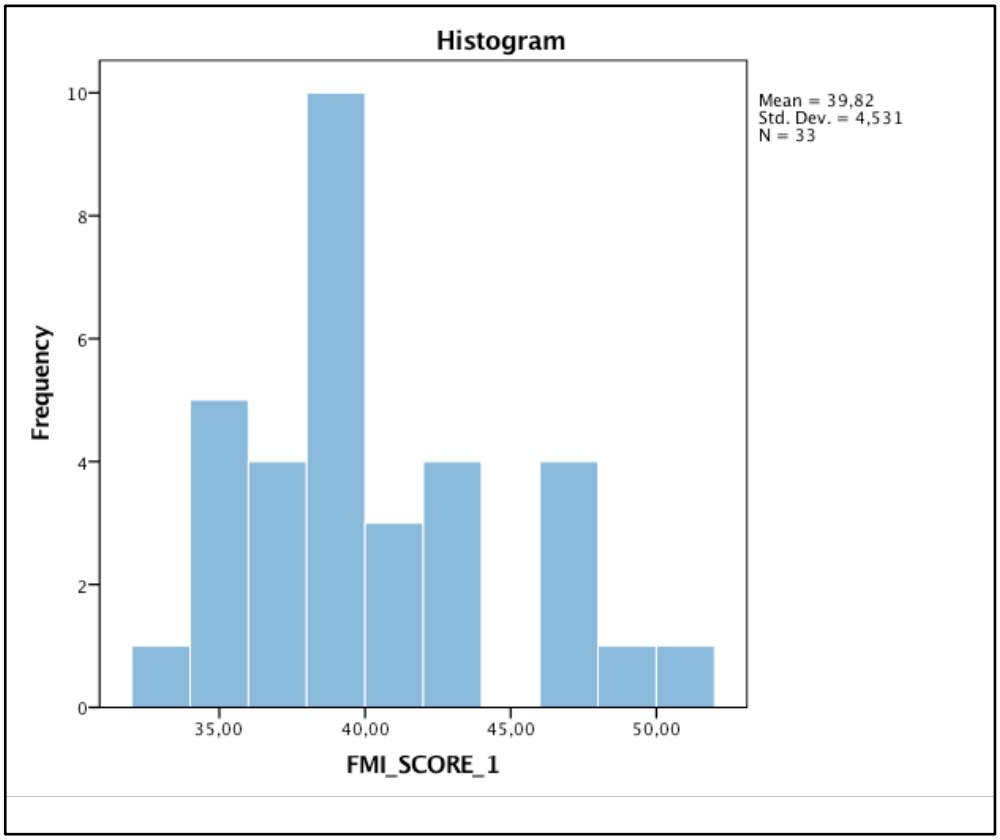


Figure 8: Histogram of the mindfulness sum score at time point 2

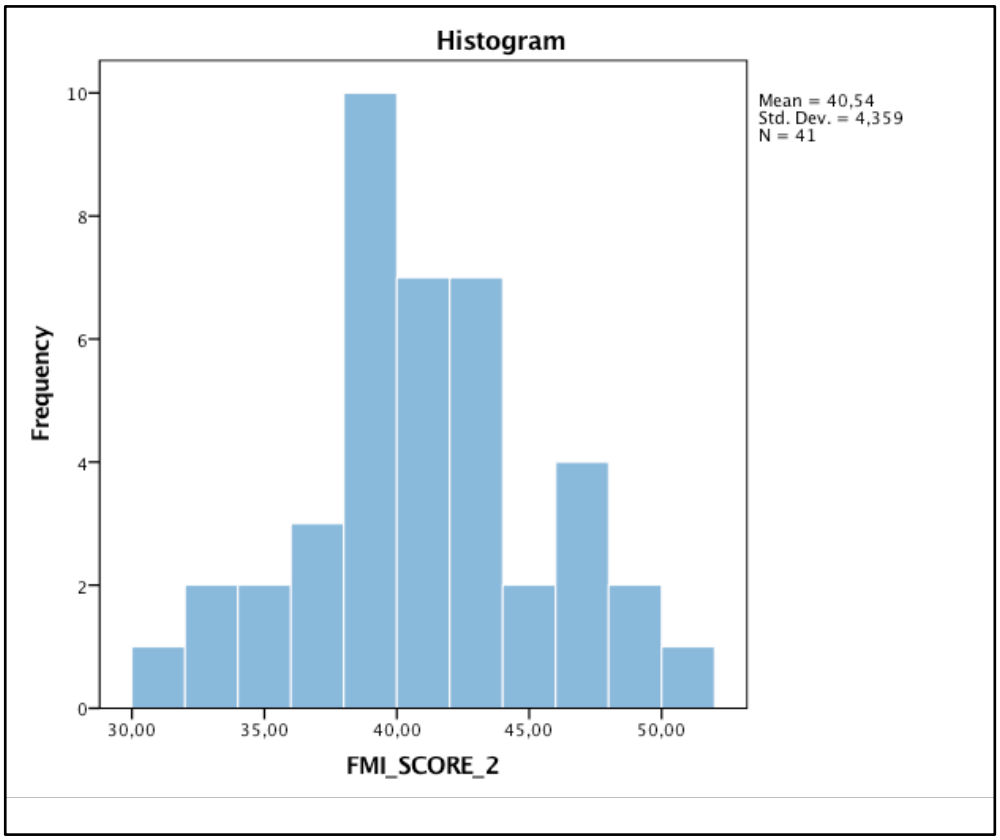


Figure 9: Histogram of the resilience sum score time point 1

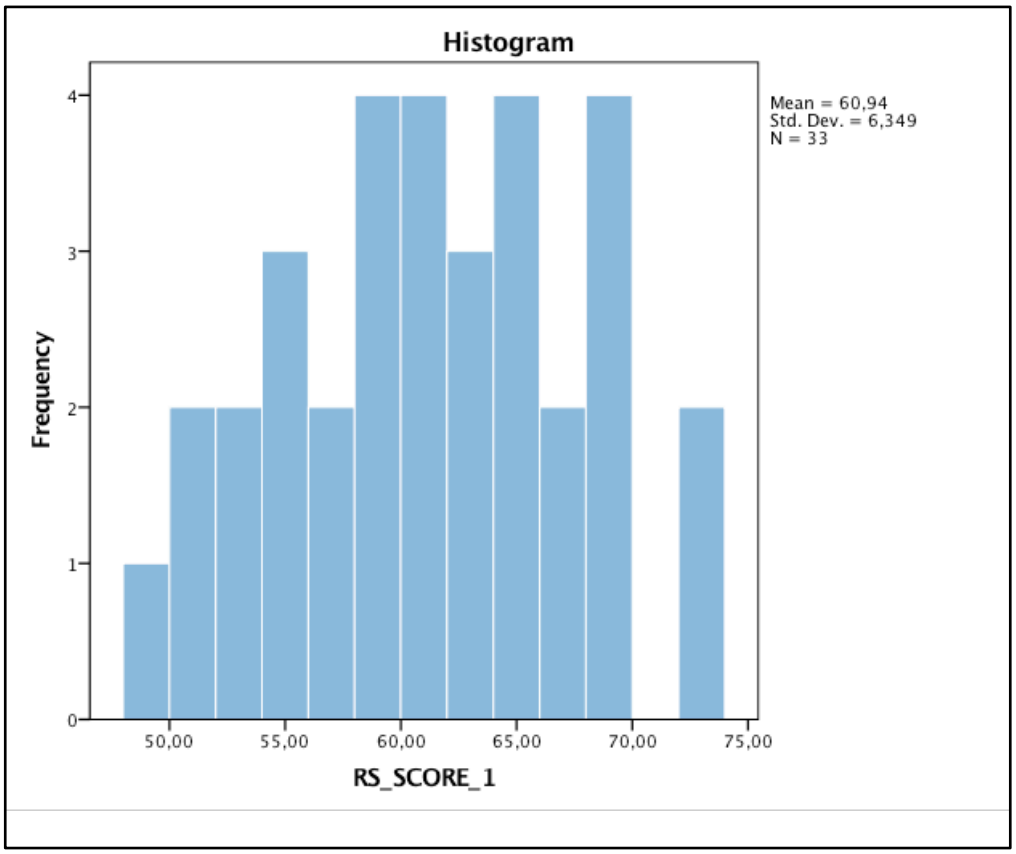
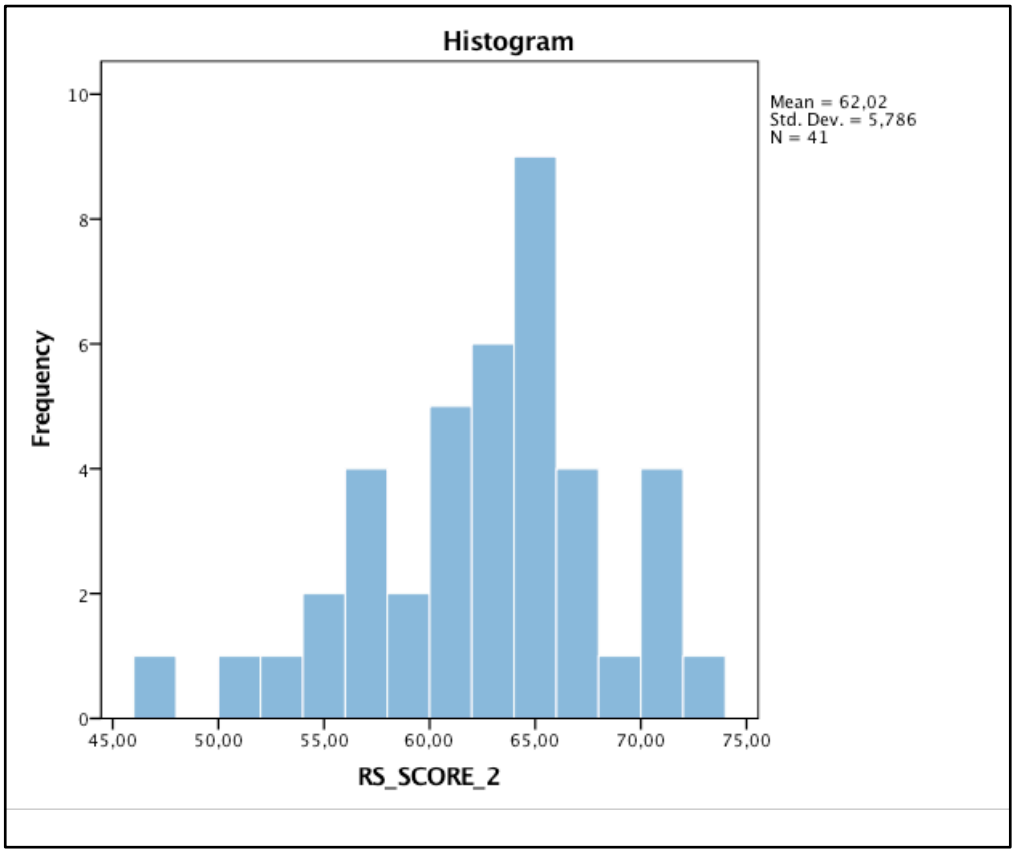


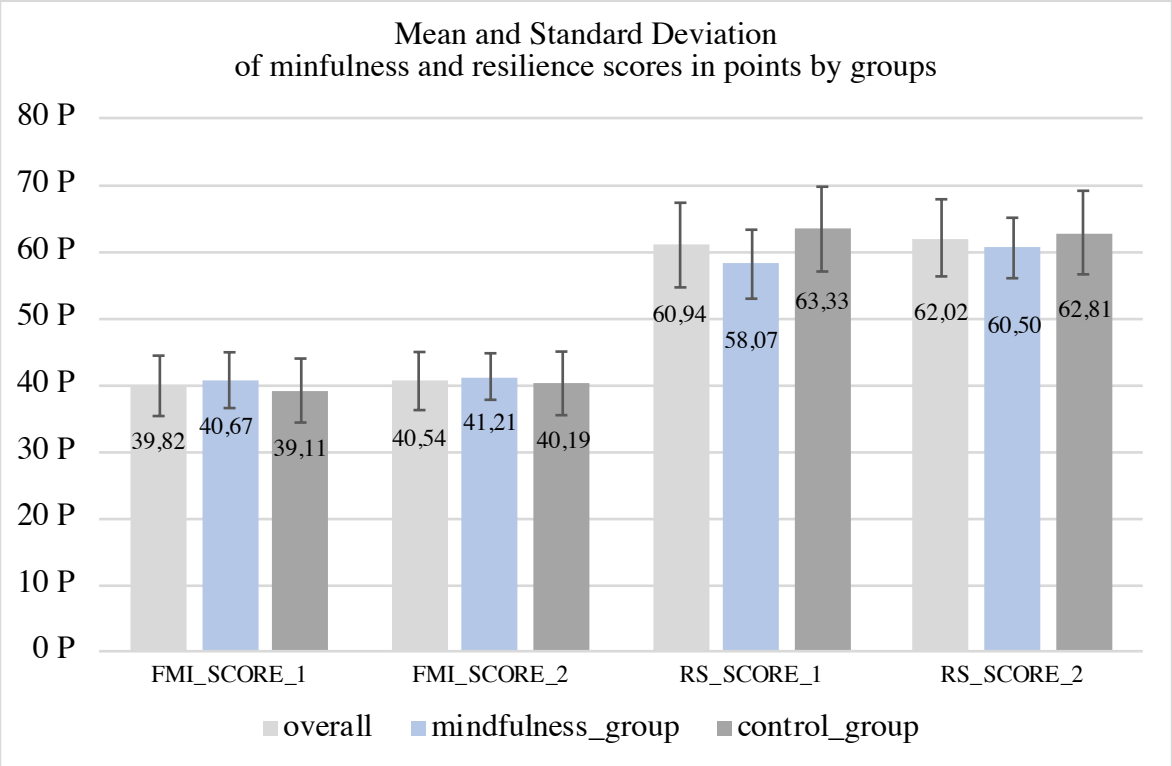
Figure 10: Histogram of the resilience sum score at time point 2



By analyzing the histograms no outliers could be identified. This can be additionally confirmed by the test for normal distribution as the Shapiro-Wilk´s test is not significant for all of the sum scores ($p > .05$). Moreover, mindfulness and resilience scores were normally distributed for both groups (mindfulness group and control group). Therefore, all sum scores are considered as normal distributed in this investigation.

Furthermore, a display of the differences in the scores is added for having a more detailed picture of the score distribution. Figure 11 shows the mean and the standard deviation of the mindfulness and resilience scores for both groups. For a better overview the overall score was added.

Figure 11: Mean and Standard Deviation of the sum scores at t1 and t2



First tendencies in the score distribution can be identified here.

The FMI score in the mindfulness group was slightly higher in t2 (41,21 ± 3,49 points) than at t1 (40,67 ± 4,11 points). Among the controls the FMI score was slightly lower than in the intervention group. Over time it showed also minimal improvement (t1:39,11 ± 4,80 points; t2: 40,19 ± 4,77).

The mean of the RS score in the intervention group the was 2,43 points higher at t2 (60,50 ±4,53) compared to t1 (58,07 ± 5,17 points). While the RS score for the control group slightly decreased from t1 (63,33 ± 6,36 points) to t2 (62,81 ± 6,26 points).

A detailed display of the results on group and time differences in accordance with the hypothesis will be given in the next section.

4.2 Results for the hypotheses

The results for testing the hypotheses H1, H2 and H3 are presented here.

4.2.1 First hypothesis

H1: Mindfulness positively influences the resilience of teaching professionals.

To assess a linear relationship between mindfulness and resilience and to predict the value of resilience as the dependent variable a linear regression analyses was conducted. For specific results and for a better consideration of changes over the time results are presented in the following modified SPSS tables for the two time points.

4.2.1.1 First time point

Table 2: H1and t1, modified SPSS table; linear regression Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,581[a]	,338	,294	5,33606	1,931

a. Predictors: (Constant), group, FMI_SCORE_1
b. Dependent Variable: RS_SCORE_1

According to the overall fit of the model, the mindfulness score and the groups (intervention group and control group) were accounted for 33,8% of the variation in the resilience score in the sample at t1 (R^2= ,338). But 29,4% of the variance was explained by the two predictors in the population (Adjusted R^2 = ,294). Adjusted R^2 was used due to the small sample size and having more than one predictor. According to Cohen (1988) this can be assessed as a small effect size.

Table 3: H1and t1, modified SPSS table; linear regression ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	435,672	2	217,836	7,650	,002[b]
	Residual	854,207	30	28,474		
	Total	1289,879	32			

a. Dependent Variable: RS_SCORE_1
b. Predictors: (Constant), group, FMI_SCORE_1

The ANOVA table showed, that there is an influence by the two predictors at t1. The mindfulness level and the training group statistically significantly predicted the resilience level, F[2,30]=7,65, p = ,002.

Table 4: H1and t1, modified SPSS table; linear regression Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	28,633	9,426		3,038	,005	9,383	47,883
	FMI_SCORE_1	,572	,211	,408	2,707	,011	,141	1,004
	group	6,157	1,894	,490	3,250	,003	2,288	10,026

a. Dependent Variable: RS_SCORE_1

The slope coefficient is statistically significant for both predictors (p< ,05) at t1, which implies that there is a linear relationship between the mindfulness level and the resilience level. Also it indicated a linear relationship between the group affiliation (intervention and control group) and the resilience level of teaching professionals at the first time point of measurement.

Going into more detail it can be stated that per 1 point increase of the FMI score the RS score increases by 0,572 points (95% CI: 0,141 to 1,004, p= ,011). As the controls coded higher in the data set than the intervention group, the unstandardized coefficient indicates that the controls have a 6,157 points higher resilience score than the participants of mindfulness intervention group (95% CI: 2,288 to 10,026, p= ,003).

4.2.1.2 Second time point

Table 5: H1and t2, modified SPSS table; linear regression Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,524[a]	,274	,236	5,05672	1,946

a. Predictors: (Constant), group, FMI_SCORE_2
b. Dependent Variable: RS_SCORE_2

The model summary table for t2 showed that 23,6% of the variance was explained by the two predictors in the population (Adjusted R^2 = ,236). This result is indicative for a small effect size, according to Cohn´s (1988) classification.

Table 6: H1and t2, modified SPSS table; linear regression ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	367,299	2	183,649	7,182	,002[b]
	Residual	971,677	38	25,570		
	Total	1338,976	40			

a. Dependent Variable: RS_SCORE_2
b. Predictors: (Constant), group, FMI_SCORE_2

Further, the FMI score and the group statistically significantly predict the RS score F[2,38]=7,182, p = ,002. The mindfulness level and the group influence the resilience level at t2, referring to this analysis.

Table 7: H1and t2, modified SPSS table; linear regression Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95,0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	30,691	8,310		3,693	,001	13,868	47,514
	FMI_SCORE_2	,651	,185	,490	3,526	,001	,277	1,025
	group	2,985	1,676	,248	1,781	,083	-,409	6,378

a. Dependent Variable: RS_SCORE_2

But the slope coefficient is significant only for one predictor (FMI score) at the second time point (p= ,001). Per 1 point increase of the mindfulness score the resilience score increases by 0,651 points (95% CI: ,277 to 1,025). This effect increases in comparison to the first time point.

The effect of the group is no longer significant p=0.083.

4.2.2 Second Hypothesis

H2: Participants of the mindfulness training have a higher *mindfulness level* than the participants of the control group.

Referring to the methodological description in the section data analysis, the results of the two-way repeated ANOVA analyses are presented here for determining the main differences in the mindfulness scores referring group and time. For further clarification in the main effect the results of the Paired Samples T-Test are presented.

Table 8: H2, modified SPSS table; ANOVA Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	96514,305	1	96514,305	2734,729	,000	,990	2734,729	1,000
group	28,971	1	28,971	,821	,373	,028	,821	,141
Error	988,179	28	35,292					

a. Computedusingalpha =

Given by the Test of Between-Subjects Effects, there is no significant main effect between intervention and control group for the mindfulness score (F[1,28]= ,821 p= ,373, partial η2= ,028). The mindfulness intervention group does not have a different mindfulness score than the participants of the control group.

Additionally, a low statistical power of 14,1% was observed. It is possible that the null hypothesis might be accepted although the alternative hypothesis is true (Nayak, 2010).

Table 9: H2, modified SPSS table; ANOVA Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	ObservedPower[a]
time	Linear	3,868	1	3,868	,946	,339	,033	,946	,156
time * group	Linear	,268	1	,268	,066	,800	,002	,066	,057
Error (time)	Linear	114,482	28	4,089					

a. Computedusingalpha =

For identifying, whether the mindfulness and the control group are interacting with the time, the Within-Subjects Contrasts table is reported. The interaction between time and group is not significant (F[1,28]= ,066 p= ,80, partial η2= ,002).

Table 10: H2, modified SPSS table; T-Test Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	FMI_SCORE_2 - FMI_SCORE_1	,50000	2,81315	,51361	-,55045	1,5504	,974	29	,338

For further analyzing the time factor, the Paired Samples T-Test was run. As the study had a last intervention-post intervention time set-up, no change over time was expected. The last day of mindfulness intervention training was t1 and the follow-up-meeting was t2. Sustainable scores were desired. Data are mean ± standard deviation, unless otherwise stated. At second time point the mindfulness score was slightly higher (40,40 ± 4,13 points) compared to the first time point of measurement (39,90 ± 4,69 points), according to the Paired Samples Statistics. This is a mean difference of ,5 Points. But there was no statistically significant differences of the mindfulness scores between t1 and t2 (t[29]= .974 p= ,338). Consequently, there was no increase or decrease in the mindfulness score over time.

4.2.3 Third Hypothesis

H3: Participants of the mindfulness training have a higher *resilience level* than the participants of the control group.

Based on the same procedure as analysis for H2, the results of the two-way repeated ANOVA and the Paired Samples T-Test are given. Here, analysis for the resilience score showed the following results.

Table 11: H3, modified SPSS table; ANOVA Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	ObservedPowera
Intercept	223995,344	1	223995,344	3926,448	,000	,993	3926,448	1,000
group	172,811	1	172,811	3,029	,093	,098	3,029	,390
Error	1597,339	28	57,048					

a. Computedusingalpha =

There is no significant main effect between intervention and control group referring the resilience score (F[1,28]= 3,092 p= ,093, partial η2= ,098). Here, the mindfulness intervention group does not have a higher score than the participants of the control group. Moreover, the test showed a low statistical power of 39,0%. Also in this case it is possible that the null hypothesis might be accepted even if the alternative hypothesis might be true (Nayak, 2010).

Table 12: H3, modified SPSS table; ANOVA Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	ObservedPower[a]
time	Linear	12,144	1	12,144	1,421	,243	,048	1,421	,210
time * group	Linear	15,744	1	15,744	1,842	,186	,062	1,842	,259
Error (time)	Linear	239,339	28	8,548					

a. Computedusingalpha =

There was no statically significant interaction effect between the groups factor and the time factor with focus on the resilience level (F[1/28]=1,842 p= ,186, η2 = ,062), as assessed by the analyses.

Table 13: H3, modified SPSS table; T-Test Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	RS_SCORE_2 - RS_SCORE_1	,83333	4,19428	,76577	-,73284	2,39950	1,088	29	,285

The closer consideration of the data from the T-test stated that the resilience score was ,083 points higher at t2 (61,76 ± 5,53 points) compared to t1 (60,93 ± 6,26 points). But there were no statistically significant differences of the resilience scores between t1 and t2 (t[29]= 1,088 p= ,285).

4.3 Summary of results

With reference to the hypothesis this study showed diverse findings. According to the results it can be assumed that mindfulness positively predicts the resilience level of teaching professionals. Also, the group variable, like being in the intervention group of the mindfulness training or being in the control group positively predicted the resilience level. Results were significant for the t1 and t2.(ANOVA). But for both time points the mindfulness score and the groups only explained a small percentage of the variance in resilience and showed small effect sizes (t1: Adjusted R^2 = ,294, t2: Adjusted R^2 = ,236).

Additionally, analyses of the change over time in the coefficients showed that the effect of mindfulness on resilience increased from 0,572 to 0,651 resilience points. But even if effects of the group were significant at t1 (B=6,157, 95% CI: 2,288 to 10,026, p= ,003)., the effect of the group was no longer significant for t2.

Therefore, it can be assumed that there might be a general influence of mindfulness on resilience of these work profession but that the group factor like (being in the intervention group or not being in the intervention group) did not have an influence on resilience. This means that the intervention in this case did not have an influence.

This might be also underlined by the further results of testing whether participants of the mindfulness training have a higher mindfulness level than the participants of the control group and whether they further have a higher resilience level than the controls.

Here, there was no significant main effect between intervention and control group referring the mindfulness core and the resilience score (Between-Subjects effects). Furthermore, there was no statistically significant interaction effect between the group factor and the time factor. (Within-Subjects). Due to the low statistical power (H2: 14,1%, H3: 39,0%) it is possible that the null hypothesis is accepted although alternative hypotheses might be true.

The performed T-tests also stated no significant score differences between t1 and t2.

With reference to the hypothesis it can be stated as the following:

H1 can be accepted.

H2 must be rejected.

H3 must be rejected.

5. Discussion

After presenting the results from the previous chapter, this chapter will discuss benefits and limitations of this research, draw conclusions and will give recommendations for further scientific investigations.

5.1 Benefits of the study

This study tried to reach the highest possible quality in its study design. Randomized control trials are accepted as the gold standard investigating the effects of rare treatments (Wright, 2009). Here, even though a randomization couldn´t be offered, this study still has some advantages. Due to other reviews, studies about mindfulness interventions are often uncontrolled (Baer, 2003). The inclusion of two time points of measurement on the one side and the inclusion of a control group on the other side can be valued as strength in this study design.

Also, this study collaborated with the responsible authority for teaching professionals as they are responsible for intervention and keeping a healthy workforce in this setting. Therefore, the controls were recruited out of the same environmental setting as the intervention group. Both groups participated at Li-based training services in the same building to keep environmental influences low or similar. Data collection took place in the same time period. The instruments used for mindfulness and resilience were standardized and offered good psychometric probertites (Wagnild, 2009). The use of sum scores also provided a higher variable level (Field, 2009). Ethical considerations like voluntariness and anonymity were given.

With reference to the described current state of knowledge, the literature research suggested that this study is highly innovative in assessing the effect of whether a mindfulness training enhances the mindfulness scores and the resilience scores of German teaching professionals. Indeed, some other studies investigate the effect of mindfulness training on students outcomes (Volanen et al., 2016)(Galante et al., 2018). But the already researched outcomes especially for the German setting were mostly self-regulation, class room performance or outcomes of the students health (Rupprecht et al., 2017).

According to systematic reviews' positive influences of mindfulness training on resilience had been shown in a few studies but had been placed with a non-occupational setting (Joyce et al., 2018).

Moreover, teachers are a high risk group for mental health disorders but the school system needs capable and resilient teachers (Scheuch et al., 2015)(Paulus, 2008).

Therefore, this study identified knowledge gaps and provides currently unique results with a relevant focus.

5.2 Limitations of the study

The previous chapters provided an insight the results and benefits of this study. But contrapositive is that this research suffered from several limitations.

A row of external and internal influencing factors possibly reduced the quality of this study. Tendencies of estimates to deviate from the true value exist in most studies to some extent. Systematic deviations from the true value are also called bias (Alejandro Jadad & Enkin, 2007). The appearance of bias in studies can lead to an overestimation or an underestimation of the results in control trials and can negatively influence the validity (Smith & Noble, 2014)(Gluud, 2006).

Bias and other limitations might have an influence on this study too. Therefore, incorrect conclusions about the effect of this intervention might be also possible and are going to be discussed here.

5.2.1 Study design

Already in the study set up are limitations which have to be mentioned. Selection bias is based on errors in the recruiting process and on the inclusion criteria of studies (Smith & Noble, 2014). In the process of recruiting participants this study only involved teaching professionals who met the inclusion criteria, which may support a higher study quality, but only from this a selection bias cannot be avoided (Alejandro Jadad & Enkin, 2007). As stated in the literature, allocation bias is "the major source of potential error" in studies (Jadad and Enkin 2007, 44).

In order to prevent or minimize selection bias the enrollment of participants in studies should be randomized, as usually done before the intervention starts (Alejandro Jadad & Enkin, 2007).

In this study, this was not possible since the group of participants who got the treatment were already selected before the study entry point. They already went through the first phase of this project. Due to the organization of the project by the Li an earlier study entry point was not possible. Indeed, it has to be mentioned "that the value of randomization in control trials […] may not overly important for all studies, particularly those that demonstrate a very large treatment effect (Wright 2009, 373). But especially since this study shows small effect sizes and a low observed power it can be stated that the missing randomization of the participants is one of the major limitations of this study.

Apart from this, the late study entry point also lead to another limitation. This study could only focus on last-intervention post-intervention measurement to identify whether results are stable over time. The first possible timepoint of measurement was the last day of intervention. It was not possible to measure at a timepoint before the intervention started. A baseline was missing. Consequently, the full effect of the training cannot be researched. This study cannot be seen as a project evaluation.

Moreover, diverse unexpected organizational and practical restraints influenced the process of data collection.

5.2.2 Data collection

Finding an appropriate control group was difficult. The Li does offer ongoing trainings but most of them are conceptualized as a drop-in class where the group of participants can come and go. But for this study design with two timepoints of measurement a constant group of participants was needed. Although the planned study design was communicated and agreed with the Li, it turned out to be difficult finding a comparable control group which met the inclusion criteria and had professional training apart from health-related contents in the same time period. Only two groups of participants met the criteria. The recruitment procedure for the controls may be also an example for possible selection bias.

Further, a loss through follow-up was not an issue but a bias through non-response at t1 might have influenced the results (Berg, 2005).

Unexpected changes in the Li´s internal training agenda in both groups lead to a partly changes in the participant information procedure and the questionnaire return procedure.

For instance, due to the training agenda changes among the training of the control group at t1 it was not possible anymore to collect the questionnaires directly in person at the training location. Participants had to receive the questionnaires via email and had to return them via Email or in paper form via envelope. The response rate was 62% for t1 among the controls which created a lack of data for t1.

Additionally, the date of follow-up meeting of the mindfulness group was postponed with an undefined date by the Li. Therefore, data collection at t2 had to be switched to collection via Email. The Li´s list with the participants contact information data like current phone numbers was only partly complete. Some participants expressed dissatisfaction about the organizational changes in the program and in the data collection. The context of the situation in which the participants fill the questionnaire and its motivational attitude can influence the answers. A lack of motivation might create negative answering tendencies (Raab-Steiner & Benesch, 2015). Also, none of the participants requested the offered personal feedback report referring their personal results.

Environmental factors affected the data collection among the intervention group at t1. According to Germany's National Meteorological Service (Deutscher Wetter Dienst) a storm front called XAVIER hit Northern Germany on October 5th 2017. It lead to a partly break down of the public transportation system, highway traffic, the closure of airports, train and bus services (Haeseler, 2017). This break down caused a two-hour delay in the mindfulness training start on October 6th 2017. Four participants weren't able to show up at all. These factors in the data collection could also possibly effected the results of this study (Häder, 2006).

Moreover, as the standardized questionnaire asks about the experiences and impressions referring the topic of the past 14 days, the extent of remembering can affect the answers of the intervention group and the controls in form of a recall bias as well (Gluud, 2006). Further, as the mindfulness intervention group might have been influenced by a participation expatiation bias. Since they are the ones who got mindfulness training and the questionnaire asks about mindfulness they can expect out of this context that they have the desired exposure. This could have influenced their answering behavior (Delgado-Rodríguez & Llorca, 2004) .

On the other hand, the questions of the instruments might influence the answering behavior of the control group too. Reading questions about mindfulness and resilience and being aware of not having a mindfulness training might cause the feeling that being mindful and resilient is socially desirable. Teachers might have gotten the impression that being mindful or being resilient is a required professional skill, especially since this research collaborated with the responsible school authority.

Consequently, individuals might have over-reported activities (Bernardi, 2006). Women are more sensitive to social desirability bias. The interventions group was mostly female, and the control group was mostly male. That bias could have influenced the results (Bernardi, 2006).

5.2.3 Sample

Mentioning the allocation of certain demographic characteristics in the sample like the gender distribution brings another limitation to the discussion.

A crucial one is the small sample size and the heterogeneity of the group.

As the mindfulness training was organized and held by the Li, they determined the number of participants of the first phase and the second phase. The number of participants was limited by the Li in the application process for participation. A training with too many participants was considered as diminishing the quality of the training.

A small sample can affect the quality of this research. Researching with a small sample opens up the possibility of undermining the internal and external validity (Faber & Fonseca, 2014). The results in that case cannot be generalized to the population.

Further the small effect size might have influenced the statistical power of this study. It might be possible that the low number of participants lead to the circumstance that the study might not have been able to detect differences between mindfulness group and control group (Bhalerao & Kadam, 2010). This assumption might also be underlined by the reported low statistical power in this research.

Furthermore, the groups were remarkably heterogeneous in some aspects. Strong differences in demographic characteristics exist. A circumstance which implicates different basic requirements among the participants which could possible influence the quality of group comparison.

For instance, the participants differ from each other in variable school type.

Indeed, the majority of interventions and controls come from GYM, STS and BS in this study. Also bigger validation studies referring teachers health work with heterogeneous samples too (van Dick & Wagner, 2001). Still some factors have to be considered.

First, the allocation of school types was not the same in the intervention group than in the control group. There was no matching by school type or any other variable possible due to the small sample size.

Therefore, an imbalance in the participants' distribution of cases referring the school type still exists. This might be severe because differences in the health outcomes of teachers by school type are already scientifically confirmed (Schaarschmidt, 2004). For instance seem teachers from special schools (FS: 17%) to suffer more often from psychological disorders than teachers from the technical schools (BS: 8%)(Scheuch et al., 2015).

Second, the sample is heterogeneous in gender distribution.

In the general population in the school year 2016/2017 73% of all teachers in Germany were female (Statistisches Bundesamt, 2018). As stated in the results, the overall sample had more females than males. But analyzing it by groups the majority in the mindfulness group were female with 86,7% while in the control group only had 33,3% females but 66,7% males.

It has to be considered that especially for mental health outcomes females are more sensitive to psychological disorders. Potential risk factors like lower self-esteem, higher tendencies of body shame, gender inequality or discrimination, or genetic risk factors are identified as influential on depression prevalence, which is higher in women (Riecher-Rössler, 2017). "A similar gender gaps exist in the prevalence of anxiety, traumata-related and stress-related disorders" (Riecher-Rössler 2017, 63).

Gender disparities in mental health disorders also occur in the school system. For instance, female teachers seem to suffer more from burn-out than their male collogues (Hillert & Schmitz, 2004).

Also, the work related behavior is unhealthier in female than in male teaching professionals according to analyses with the AVEM-instrument (Schaarschmidt, 2004). While 20% of the male teachers show healthy behavior, only 7% of female teachers have healthy behavior at work. Instead, female teachers rather belong to the burn-out related work patterns (41%) than their male colleagues (25%).

Consequently, as this research measured psychological outcomes the gender differences might not be unimportant as a potential influencing factor. Additionally, this research used the RS-11 questionnaire for measuring resilience. In a study from Kocalevent et al. (2015) the RS-11 was also used to identify the level of resilience in the general population of Germany (n=5036). Results reported that women in general had significantly lower RS mean scores than man (59.3 [SD = 11.0] vs. 60.0 [SD = 10.2]).

Coming back to this study by considering that the control group had more males and higher RS scores while the intervention group had more females and lower RS Scores, the gender distribution might have influenced the group results.

Besides the gender heterogeneity, the sample showed differences in the mindfulness pre-experience between intervention and control group. As assumed, the control group had less pre-experience with mindfulness practices compared to the intervention group. Still, 16,7% teachers in the control group had some pre-experience while even 11,2 % responded that they have much and very much pre-experience. Of course, controls should be unaware about the intervention and not getting the intervention (Alejandro Jadad & Enkin, 2007). Experience, knowledge or even frequently practicing mindfulness should have been an exclusion criteria in the recruitment process. But as mentioned, the intervention started before the study entry. Also, an exclusion of participants among the controls was refused, since there was already only a small amount of alternate trainings and participants for the control group. Also in accordance with the Li, picking out only a few participants out of a real ongoing training group seemed unethical and unrealistic.

Nevertheless, the pre-experience of controls might be another weakness in the sample.

5.2.4 Measuring mindfulness and resilience

Furthermore, working with mindfulness in research can bring other obstacles. There are difficulties in defining mindfulness (Chiesa, 2013). For instance, there is no consent on which dimensions of mindfulness should be included in the definition. Also, if they are included, still different opinions about the definition of the dimension appear.

For instance, while some voices argue that awareness, as being a part of mindfulness, is a state of an open and widespread mind, others argue that awareness is always the concentration and focus on a specific object (Wallace, 2012).

Also others discuss the role of being non-judgmental and criticize that modern psychologists see mindfulness as a construct without any critical or ethical reflection at all (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Wallace (2012) underlined that this view might be a severe contradiction with regards to the understanding of mindfulness in the Buddhist tradition. Also, other advocates like Ricard (2012) stated that the mindfulness construct also includes other human qualities like empathy and ethical considerations (Ricard, 2012). The development of a western construct might be seen as the separation from other values and a distortion of what was originally meant (Gethin 2012).

Of course, mindfulness researchers did base the development of an instrument on a stated definition. Even if it sometimes not the same definition. Then, in accordance with this definition, mindfulness has been measured.

But if there is no consent in research about the meaning or inclusive dimensions, and more important, the definition of mindfulness in the first place: what do we actually measure?

It can be questioned whether research is able to identify effects of a complex concept like this when scientists and discourse holders of Buddhism cannot even agree on an common, overall basic definition of mindfulness (Hyland, 2016). Even if scientists try to specify by stating that they refer to the western model of Mindfulness or certain definitions, they still do not include the same dimensions of mindfulness in their instruments. For instance, some of them rather include focus on awareness, while others include focus on acceptance. Critics highlight that some dimensions of mindfulness like ethical responsibility are missing entirely. But all of them claim to measure mindfulness.

Moreover, several descriptions of mindfulness suggest that mindfulness is a "multifaceted construct[…]" with a "[…] multidimensional nature"(Baer et al. 2006, 28).

By focusing on the development of research instruments, it can be seen "as a multifaced trait […]" where "[…] other authors suggest that any attempt to operationalize the construct of mindfulness into a single faceted construct does not take into account the complexity"(Chiesa 2013, 260).

In any case, some voices say that mindfulness might have been narrowed down already on what is necessary for defining it to make it measurable (Gethin 2012). The already developed instruments also gain in complexity and offer good psychometrical properties (Chiesa, 2013).

In this study, the standardized FMI-14 short item questionnaire was used. As this instrument was reported by Walach et al. (2009) as being semantically independent from the Buddhist tradition and it also measures only a general factor the "criticism on the current definitions of mindfulness" might be also a vulnerable point of this study (Chiesa 2013, 262).

Although not to the same extent it is necessary to mention that the measurement of resilience also has similar limitations.

Gu and Day (2007, 1302) wrote about teachers' resilience: "The concept of resilience is located in the discourse of teaching as emotional practice and is found to be a multidimensional, socially constructed concept that is relative, dynamic and developmental in nature". This also implies a complexity. There are also difficulties in stating a common definition and in having a clear separation to other concepts.

As an example, Rice & Liu (2016) stated that the amount of studies measuring resilience is huge but that resilience is often mixed up with other terms like coping. Some of them even refer to coping and resilience simultaneously in their outcome measures.

Davydov et al. (2010) concluded: "[…] the resilience concept in mental health research is currently hindered by a lack of unified methodology and poor concept definition".

Consequently, concerns about operationalization do exist in both constructs.

6 Conclusion

This non-randomized intervention study investigated whether a mindfulness training sustainably improves the mindfulness level and the resilience level of teaching professionals based on a mindfulness intervention program for school staff at the City State of Hamburg.

On the one hand, the results suggest a significant influence of mindfulness on resilience for both time points of measurement. The lack of significant differences or change in the scores over time implies a stable score and therefore a possible indicator for having sustainability in this last intervention post-intervention design.

On the other hand, the group factor (being in the mindfulness intervention group or in the control group) did not have an influence on the resilience level of the teachers. This inference had been made since the group factor did not show a significant influence on resilience at t2 and further repeated measures ANOVA analyses did not show significant interactions. Same can be interpreted by the not significant T-Test results.

Additionally, the study has a wide range of limitations. Like other mindfulness studies, this research suffered by underpowered design and a lack of randomization. Also considering these factors the research question has to be answered in the following manner in this study.

The mindfulness training did not sustainably improve the mindfulness level and the resilience level of teaching professionals. This non-randomized intervention study could not identify a positive influence of mindfulness and resilience of teaching professionals by a mindfulness intervention.

Despite this, good quality non-randomized studies “can also provide high quality evidence” but should demonstrate a large intervention effect and have to be designed that bias is kept small (Wright 2009, 373). These requirements should be considered in further research. The lack of uncontrolled trials with inappropriate sample sizes must be overcome (Keng et al., 2011)

Further, resilience and also mindfulness are both multidimensional and complex constructs. Both lack on an overall common definition which can bring difficulties in operationalization.

Therefore, further research should focus on the improvement in conceptual work and conduct data analyses that are routinely applied to clarify meanings (Windle 2010).

The gap in multidisciplinary evidence should be minimized. Mindfulness interventions are still rather applied in clinical trials than in non-clinical settings. But mindfulness is also useful in occupation and especially relevant in high risk workforces (Joyce et al., 2018). Therefore, more research of mindfulness and resilience in occupational health is needed if we wish to accomplish changes in individual and organizational performance (Mallak, 2016, 237).

Especially in the context of the high mental burden of the teaching professionals intervention is important (Rothland, 2013). But mindfulness interventions with proper scientific evaluation are very rare. So far, this study has an innovative and unique character.

Mindfulness research in educational context is still in its early stages of development. Not seldom promising procedures got implemented in schools but do not bring the desired results. If the practice of mindfulness in schools might be not beneficial then it might be reasonable to take other approaches and go other ways. Therefore, it might be wise to take slow and well-conceived steps towards further implementation of mindfulness in the educational setting (Elsholz & Keuffer, 2012).

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Appendix I: additional tables

SPSS frequency tables for population describing variables by groups:

Statistics

group			sex_1	sex_2	age_1	age_2	pre-experiance_1	pre-experiance_2
group_mind	N	Valid	15	14	15	14	15	14
		Missing	0	1	0	1	0	1
	Mean		,87	,86	50,733	3,47	3,47	3,36
	Std. Deviation		,352	,363	7,8601	1,060	1,060	,929
	Range		1	1	29,0	4	4	3
	Minimum		0	0	33,0	1	1	2
	Maximum		1	1	62,0	5	5	5
	Percentiles	25	1,00	1,00	3,00	46,750	3,00	3,00
		50	1,00	1,00	3,00	50,500	3,00	3,00
		75	1,00	1,00	4,00	55,750	4,00	4,00
group_control	N	Valid	18	26	18	26	18	26
		Missing	11	3	11	3	11	3
	Mean		,33	,50	43,833	1,89	1,89	2,23
	Std. Deviation		,485	,510	11,0627	1,231	1,231	1,275
	Range		1	1	33,0	4	4	4
	Minimum		0	0	28,0	1	1	1
	Maximum		1	1	61,0	5	5	5
	Percentiles	25	,00	,00	1,00	35,000	1,00	1,00
		50	,00	,50	1,00	38,500	2,00	2,00
		75	1,00	1,00	3,00	52,250	3,25	3,25

sex_1

group			Frequency	Percent	Valid Percent	CumulativePercent
group_mind	Valid	male	2	13,3	13,3	13,3
		female	13	86,7	86,7	100,0
		Total	15	100,0	100,0	
group_control	Valid	male	12	41,4	66,7	66,7
		female	6	20,7	33,3	100,0
		Total	18	62,1	100,0	
	Missing	System	11	37,9		
	Total		29	100,0		

sex_2

group			Frequency	Percent	Valid Percent	CumulativePercent
group_mind	Valid	male	2	13,3	14,3	14,3
		female	12	80,0	85,7	100,0
		Total	14	93,3	100,0	
	Missing	System	1	6,7		
	Total		15	100,0		
group_control	Valid	male	13	44,8	50,0	50,0
		female	13	44,8	50,0	100,0
		Total	26	89,7	100,0	
	Missing	System	3	10,3		
	Total		29	100,0		

school_type_1

group			Frequency	Percent	Valid Percent	CumulativePercent
group_mind	Valid		1	6,7	6,7	6,7
		BS	4	26,7	26,7	33,3
		FS	1	6,7	6,7	40,0
		GS	1	6,7	6,7	46,7
		GYM	4	26,7	26,7	73,3
		STS	4	26,7	26,7	100,0
		Total	15	100,0	100,0	
group_control	Valid		11	37,9	37,9	37,9
		BS	2	6,9	6,9	44,8
		FS	1	3,4	3,4	48,3
		GS	1	3,4	3,4	51,7
		GYM	4	13,8	13,8	65,5
		STS	10	34,5	34,5	100,0
		Total	29	100,0	100,0	

school_type_2

group			Frequency	Percent	Valid Percent	CumulativePercent
group_mind	Valid		1	6,7	6,7	6,7
		BS	5	33,3	33,3	40,0
		GS	1	6,7	6,7	46,7
		GYM	4	26,7	26,7	73,3
		STS	4	26,7	26,7	100,0
		Total	15	100,0	100,0	
group_control	Valid		3	10,3	10,3	10,3
		BS	2	6,9	6,9	17,2
		FS	1	3,4	3,4	20,7
		GS	3	10,3	10,3	31,0
		GYM	4	13,8	13,8	44,8
		STS	16	55,2	55,2	100,0
		Total	29	100,0	100,0	

pre- experiance_1

group			Frequency	Percent	Valid Percent	CumulativePercent
group_mind	Valid	keine	1	6,7	6,7	6,7
		mittelmäßig	8	53,3	53,3	60,0
		viel	3	20,0	20,0	80,0
		sehr viel	3	20,0	20,0	100,0
		Total	15	100,0	100,0	
group_control	Valid	keine	10	34,5	55,6	55,6
		kaum	3	10,3	16,7	72,2
		mittelmäßig	3	10,3	16,7	88,9
		viel	1	3,4	5,6	94,4
		sehr viel	1	3,4	5,6	100,0
		Total	18	62,1	100,0	
	Missing	System	11	37,9		
	Total		29	100,0		

pre- experiance_2

group			Frequency	Percent	Valid Percent	CumulativePercent
group_mind	Valid	kaum	2	13,3	14,3	14,3
		mittelmäßig	7	46,7	50,0	64,3
		viel	3	20,0	21,4	85,7
		sehr viel	2	13,3	14,3	100,0
		Total	14	93,3	100,0	
	Missing	System	1	6,7		
	Total		15	100,0		
group_control	Valid	keine	10	34,5	38,5	38,5
		kaum	7	24,1	26,9	65,4
		mittelmäßig	3	10,3	11,5	76,9
		viel	5	17,2	19,2	96,2
		sehr viel	1	3,4	3,8	100,0
		Total	26	89,7	100,0	
	Missing	System	3	10,3		
	Total		29	100,0		

SPPS descriptive table for the scores by groups:

DescriptiveStatistics

group		N	Rang	Min	Max	Mean	Std. Deviation	Variance
group_mind	FMI_SCORE_1	15	14,00	35,00	49,00	40,6667	4,18614	17,524
	FMI_SCORE_2	14	12,00	36,00	48,00	41,2143	3,49017	12,181
	RS_SCORE_1	15	18,00	49,00	67,00	58,0667	5,17503	26,781
	RS_SCORE_2	14	15,00	52,00	67,00	60,5000	4,53618	20,577
	Valid N (listwise)	14						
group_control	FMI_SCORE_1	18	18,00	33,00	51,00	39,1111	4,80060	23,046
	FMI_SCORE_2	27	19,00	31,00	50,00	40,1852	4,77201	22,772
	RS_SCORE_1	18	23,00	50,00	73,00	63,3333	6,36165	40,471
	RS_SCORE_2	27	25,00	47,00	72,00	62,8148	6,26981	39,311
	Valid N (listwise)	16						

SPPS Test of Normality Table for the scores by groups:

Tests ofNormality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	group	Statistic	df	Sig.	Statistic	df	Sig.
FMI_SCORE_1	group_mind	,213	14	,084	,928	14	,282
	group_control	,196	16	,102	,902	16	,088
FMI_SCORE_2	group_mind	,166	14	,200*	,943	14	,463
	group_control	,128	16	,200*	,975	16	,913
RS_SCORE_1	group_mind	,126	14	,200*	,971	14	,895
	group_control	,148	16	,200*	,958	16	,617
RS_SCORE_2	group_mind	,201	14	,130	,928	14	,283
	group_control	,196	16	,103	,929	16	,238

*. This is a lower bound of the true significance.

a. LillieforsSignificanceCorrection

Appendix II: questionnaire

Li Hamburg & HAW Hamburg (Daniela Weihs, MSc. Health Sciences, 3. Sem)

Befragung:

Zusammenhang von Achtsamkeit und Resilienz

HAW HAMBURG

Landesinstitut für Lehrerbildung und

Falsch angekreuzt? □ x □ □
Korrektur bitte so: □ ■ □ x

Vielen Dank, dass Sie an dieser Befragung teilnehmen. Gerne möchten wir erforschen, wie sich Achtsamkeit und Resilienz (psychische Widerstandsfähigkeit) verändern und miteinander im Zusammenhang stehen. Die Daten werden vom Li Hamburg in Zusammenarbeit mit der HAW Hamburg im Rahmen einer Masterarbeit erhoben und verarbeitet.

Wir möchten Sie bitten, so ehrlich und spontan wie möglich zu antworten. Es gibt keine „richtigen" oder „falschen" und keine „guten" oder „schlechten" Antworten. Ihre persönlichen Erfahrungen sind uns wichtig. Vielen Dank für Ihr Bemühen!

Bevor Sie beginnen, erstellen Sie bitte ein persönliches Kennwort. Durch das Kennwort ist es möglich, Ihre Angaben aus diesem Fragebogen, mit den Angaben späterer Befragungen zu vergleichen, ohne dass wir Ihren Namen kennen. Somit bleibt Ihre Anonymität gewahrt.

Beispiel:
Vorname Mutter: ***Gu****drun*
Geburtstag Mutter: ***08****.12.1935*
Vorname Vater: ***Ka****rl-Heinz*

Kennwort: G. U. 0. 8. K. A.

Ihr Kennwort:
Die 2 ersten Buchstaben des Vornamens Ihrer Mutter: _____
Der Geburtstag Ihrer Mutter: _____
Die 2 ersten Buchstaben des Vornamens Ihreres Vaters: ____

Ihr Kennwort: . . . . . .

Zunächst bitten wir Sie um einige allgemeine Angaben sowie Angaben zu Ihrem Beruf

1. Sind Sie weiblich oder männlich? ☐ weiblich ☐ männlich

2. Bitte geben Sie Ihr Alter an: _____ Jahre

3. In welcher Schulform arbeiten Sie?

☐ Grundschule ☐ Stadtteilschule ☐ Gymnasium
☐ Sonder-/Förderschule ☐ nicht an der Schule tätig ☐ berufliche Schule

4. Wie viele Stunden unterrichten Sie derzeit in der Woche? _____

5. Wie viele Stunden pro Woche wenden Sie ungefähr außerhalb des Unterrichts auf? _____

6. Wie viel Vorerfahrung haben Sie zum Thema Achtsamkeit oder Entspannungstechnicken (zB. MBSR-Training, Yoga, Qigong)? ☐ keine ☐ kaum ☐ mittelmäßig ☐ viel ☐ sehr viel

Bitte beziehen Sie dabei die Aussagen auf die letzten _**14**_ Tage.
Kreuzen Sie bitte bei jeder Frage die Antwort an, die am besten auf Sie zutrifft.

	fast nie	eher selten	relativ oft	fast immer
1. Ich bin offen für die Erfahrung des Augenblicks.	☐	☐	☐	☐
2. Ich spüre in meinen Körper hinein, sei es beim Essen, Kochen, Putzen, Reden.	☐	☐	☐	☐
3. Wenn ich merke, dass ich abwesend war, kehre ich sanft zur Erfahrung des Augenblicks zurück.	☐	☐	☐	☐
4. Ich kann mich selbst wertschätzen.	☐	☐	☐	☐
5. Ich achte auf die Motive meiner Handlungen.	☐	☐	☐	☐
6. Ich sehe meine Fehler und Schwierigkeiten, ohne mich zu verurteilen.	☐	☐	☐	☐
7. Ich bin in Kontakt mit meinen Erfahrungen, hier und jetzt.	☐	☐	☐	☐
8. Ich nehme unangenehme Erfahrungen an.	☐	☐	☐	☐
9. Ich bin mir selbst gegenüber freundlich, wenn Dinge schief laufen.	☐	☐	☐	☐
10. Ich beobachte meine Gefühle, ohne mich in ihnen zu verlieren.	☐	☐	☐	☐
11. In schwierigen Situationen kann ich innehalten.	☐	☐	☐	☐
12. Ich erlebe Momente innerer Ruhe und Gelassenheit, selbst wenn äußerlich Schmerzen und Unruhe da sind.	☐	☐	☐	☐
13. Ich bin ungeduldig mit mir und meinen Mitmenschen.	☐	☐	☐	☐
14. Ich kann darüber lächeln, wenn ich sehe, wie ich mir manchmal das Leben schwer mache.	☐	☐	☐	☐

Im Folgenden finden Sie eine Reihe von Feststellungen. Bitte lesen Sie sich jede Feststellung durch und kreuzen Sie an, wie sehr die Aussagen im Allgemeinen auf Sie zutreffen, d.h. wie sehr Ihr übliches Denken und Handeln durch diese Aussagen beschrieben wird.

	1= nein Ich stimme nicht zu 1	2	3	4	5	6	7=ja stimme völlig zu 7
1. Wenn ich Pläne habe, verfolge ich sie auch.	☐	☐	☐	☐	☐	☐	☐
2. Normalerweise schaffe ich alles irgendwie.	☐	☐	☐	☐	☐	☐	☐
3. Es ist mir wichtig, an vielen Dingen interessiert zu bleiben.	☐	☐	☐	☐	☐	☐	☐
3. Ich mag mich.	☐	☐	☐	☐	☐	☐	☐
5. Ich kann mehrere Dinge gleichzeitig bewältigen.	☐	☐	☐	☐	☐	☐	☐
6. Ich bin entschlossen.	☐	☐	☐	☐	☐	☐	☐
7. Ich behalte an vielen Dingen Interesse.	☐	☐	☐	☐	☐	☐	☐
8. Ich finde öfter etwas, worüber ich lachen kann.	☐	☐	☐	☐	☐	☐	☐
9. Normalerweise kann ich eine Situation aus mehreren Perspektiven betrachten.	☐	☐	☐	☐	☐	☐	☐
10. Ich kann mich auch überwinden, Dinge zu tun, die ich eigentlich nicht machen will.	☐	☐	☐	☐	☐	☐	☐
11. In mir steckt genügend Energie, um alles zu machen, was ich machen muss.	☐	☐	☐	☐	☐	☐	☐

☺ *Bitte überprüfen Sie noch einmal, ob Sie auch alle Fragen beantwortet haben.*
Vielen Dank für Ihre Teilnahme!

Appendix III: digital appendices

Appendix:	Title:
Appendix A	Master thesis_digital version
Appendix B	Questionaire_mindfulness and resilience
Appendix C	SPSS Syntax_mindfulness and resilience
Appendix D	SPSS Data file_mindfulness and resilience

Declaration of academic honesty

Hereby, I declare that I have composed the presented Master Thesis independently on my own and without any other resources than the ones indicated. All thoughts taken directly or indirectly from external sources are properly denoted as such.

Hamburg, August 27th , 2018

_____	_____
Place, Date	Daniela Weihs