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Individualization of the doctor-patient consultation
Individualisierung des Arzt-Patienten-Gesprächs

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Graz, am 26. März 2023 *Michaela Elisabeth Überwimmer eh.*

Vorwort

„Die Arzneikunst umfasst drei Stück: die Krankheit, den Kranken und den Arzt. Der Arzt sei ein Diener der Heilkunst; der Kranke soll zugleich mit ihm der Krankheit entgegenwirken.“ – Hippokrates

Das Schöne an der Medizin ist das Miteinander der verschiedenen gesundheitsberuflichen Disziplinen, um gemeinsam mit den Patienten an Heilung, oder zumindest Verbesserung der Lebensqualität zu arbeiten. Hippokrates Zitat finde ich für diese Arbeit deshalb so treffen, weil es speziell das enge Zusammenspiel zwischen Ärzten*innen und Patienten*innen hervorhebt. Das gemeinsame Ziel ist dabei immer die, wenn möglich, Heilung der Erkrankten, oder zumindest das Behandeln von Symptomen und Lindern von Leid. Im Sinne der biopsychosozialen Medizin hat sich vieles mittlerweile in Richtung Besserung gewandelt, weg von der Symptom- und Technikorientiertheit hin zu individueller, patientenzentrierter Medizin. Doch geschieht es noch immer oft genug, dass die erhobenen physischen Daten und Bilder lauter zu sprechen scheinen als die Patienten*innen, denen die Ärzteschaft Gehör schenken sollte.
Nicht gehört werden. Nicht ernstgenommen werden. Zu wenig Zeit bekommen. Das sind die Hauptkritikpunkte der Patienten*innen nach Arzt-Patienten-Gesprächen, die nicht nur die Zufriedenheit beeinträchtigen, sondern auch das Vertrauen minimieren. Ich denke, es ist allein der Mediziner*innen- Patienten*innen – Beziehung wegen geschuldet, sich mit dem Thema Ärzte*innen- Patienten*innen Kommunikation eingehender zu befassen und jeder Versuch die Kommunikation zu verbessern und Zufriedenheit zu steigern ein löblicher. Es führt kein Weg daran vorbei festzustellen, dass wir nicht nur biologische, sondern auch fühlende/erlebende, soziale und spirituelle Wesen sind und all diese Aspekte zu unserer Gesundheit beitragen. Anstatt schweigende Ignoranz an manchen Aspekten zu verüben, sollten wir achtsam jeden Teil pflegen und unsere Gesamtheit umarmen.

Danksagungen

Eine Diplomarbeit, und schon gar keine Studie, stellt ein Einmann-/Einfrauprojekt dar. Es dreht sich alles um Zusammenarbeit, neue Inputs, Kritik, neue Wege und tatkräftige Hände. Aus diesem Grund gilt dieser Teil all denen, die diese Arbeit und unsere Studie ermöglicht haben.

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Ohne tatkräftige Unterstützung wäre es nur sehr schwer möglich gewesen alle geplanten 200 Patienten*innen zu befragen. Ich möchte daher speziell den Sekretärinnen in der Anmeldung der orthopädischen Ambulanz danken, die mir die Befragung aller 100 orthopädischen Ambulanzpatienten ermöglichten, dem Hauptsekretariat der Universitätsklinik für Orthopädie und Traumatologie, sowie den Pflegefachkräften der orthopädischen Ambulanz und der chirurgischen Notaufnahme, die alle nicht mit motivierenden Worten, genügend Druckerpapier, Schokolade und Herzlichkeit geizten, gilt ebenfalls mein großer Dank.

Speziell bei den geduldigen, offenen und motivierten Teilnehmern*innen unserer Studie möchte ich mich sehr herzlich bedanken. Verbesserung ist nur da möglich, wo Menschen mutig genug sind an dieser Veränderung mitzuwirken. Danke, für die genommene Zeit, jedes Gespräch und die grenzenlose Ehrlichkeit und Offenheit.

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Meiner Familie, sowie all denen, die schon Familie anstatt Freunde sind, sag ich tausend Dank für euren Rückhalt, alle lieben und motivierenden Worte, für Tee und Kuchen, sowie das Durchatmen an der frischen Luft! Eine bessere Family kann man sich nicht wünschen!

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List of abbreviations and their explanation

Sorted as mentioned in the main text.

VUCA	Volatility, Uncertainty, Complexity, and Ambiguity
VUCA solutions	Vision, Understanding, Clarity, and Adaptability
IASP	International Association for the Study of Pain
openMEDOCS	Hospital information system
REDCap®	Research Electronic Data Capture
PROMIS Scale	Patient-Reported Outcomes Measurement Information System
CAT	Computerized Adaptive Test
NRS	Numerical Rating Scale
AAQ-II	Acceptance and Action Questionnaire II
IOU/IUS-12	short Intolerance of Uncertainty Scale
GAD	Generalized Anxiety Disorder
NCC	Need for Cognitive Closure scale
16-NCC	short German version of the Need for Cognitive Closure scale
IOA	Intolerance of Ambiguity Scale
CI	Confidence Interval
BMI	Body Mass Index
Std	Standard deviation
Std. error	Standard error

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Zusammenfassung

Das Akronym VUCA beschreibt flüchtige, turbulente Situationen und Umgebungen. Das VUCA Konzept mit seinen VUCA Faktoren Volatilität, Unsicherheit, Komplexität und Ambiguität wird in weiten Teilen an Spezialgebieten eingesetzt, darunter auch der Humanmedizin. VUCA bietet nicht nur die Möglichkeit, unsichere Situationen zu beschreiben, sondern unterstützt auch trainierte Spezialisten mit den passenden Lösungsansätzen Vision, Verständnis, Klarheit und Anpassungsfähigkeit. Weil das Model vermehrt Eindrang in den Gesundheitsbereich findet, vor allem den Krisenbewältigungsbereich und Notaufnahmen, wird es Zeit zu analysieren, ob Patienten*innen den Gesundheitsbereich als VUCA Umgebung wahrnehmen.

Es ist Ziel dieser Studie zu analysieren, ob diese Hypothese zutrifft und zu bestätigen, ob die Verwendung der VUCA Lösungsansätze zu verbesserter Patienten*innen-Zufriedenheit mit dem Ärzte*innen- Patienten*innen-Gespräch führt. 200 orthopädische Patienten*innen von zwei verschiedenen Abteilungen, der orthopädischen Spezialambulanz und der chirurgischen Notaufnahme, wurden vor und nach dem Ärzte*innen- Patienten*innen-Gespräch befragt. Der Fokus dabei lag auf der Analyse der VUCA Faktoren mittels psychologischer Fragebögen, der postinterventionellen Erfüllung der VUCA Lösungsansätze und der Patientenzufriedenheit mit der Behandlung.

Orthopädische Patienten leben in einer VUCA Welt, wobei Unsicherheit und Ambiguität die größte Rolle spielen. Patienten in der orthopädischen Ambulanz zeigen dabei durchschnittlich schwerere körperliche Einschränkung. Aus diesem Grund sind die Niveaus für Volatilität, Unsicherheit und Komplexität durchschnittlich höher, während in der chirurgischen Notaufnahme die Intoleranz für Ambiguität größer ist. Die VUCA Faktoren zeigen eine lineare, meist positive Korrelation, die impliziert, dass ein stärkerer Fokus auf die VUCA Faktoren, auch zu einer steigenden Patientenzufriedenheit führt. Je mehr VUCA Faktoren in ein Ärzte*innen- Patienten*innen-Gespräch eingebaut werden, desto stärker kann die Patienten*innen-Zufriedenheit ansteigen. Generell können höhere Zufriedenheitswerte in der chirurgischen Notaufnahme erreicht werden.

Patienten*innen in der orthopädischen Ambulanz brauchen vor allem Klarheit für ein zufriedenstellendes Ärzte*innen- Patienten*innen-Gespräch. Im Gegensatz dazu brauchen Patienten*innen in der chirurgischen Notaufnahme Verständnis und

Klarheit um das Ärzte*innen- Patienten*innen-Gespräch als zufriedenstellend zu erleben.

Patienten*innen profitieren von den VUCA Lösungen während des Ärzte*innen-Patienten*innen-Gesprächs durch einen kognitiven Abschluss und erhöhte Zufriedenheit mit der Behandlung.

Abstract

The acronym VUCA describes a changing and turbulent environment. The VUCA concept with its VUCA factors volatility, uncertainty, complexity, and ambiguity is utilized in wide ranges of expertise, inter alia medicine. But VUCA not only offers the possibility to describe uncertain situations, but also equips trained individuals with the correlating solutions of vision, understanding, clarity and adaptability. Since the concept finds increasingly more entrance into healthcare, especially crisis leadership, it is time to evaluate whether patients experience healthcare surroundings as VUCA environments. The subject of this survey is to examine this hypothesis and to confirm whether the application of the VUCA solutions leads to increasing levels of patient satisfaction with the doctor-patient-consultation.

200 orthopedic patients from two different outpatient departments, primary care patients and the orthopedic patients with elective appointments, were questioned before and after the doctor-patient-consultation. The focus was laid on evaluating the VUCA factors using psychosocial questionnaires, the postinterventional fulfillment of VUCA solutions and patient satisfaction with the consultation.

It was found that orthopedic patients do live in a VUCA world, struggling especially with uncertainty and ambiguity. Patients with elective appointments experience higher rates of physical impairment. Volatility, uncertainty, and complexity levels are on average higher, while the intolerance of ambiguity level is more prominent with primary care patients. The VUCA factors show a linear correlation, mostly positive, which implies that an increased focus on the VUCA solutions leads to an increase in patients' satisfaction. The more VUCA solutions are addressed during the doctor-patient consultation, the higher patient satisfaction will be. Higher satisfaction levels can be obtained at the primary care unit.

Orthopedic patients with elective appointments especially need clarity for a satisfactory doctor-patient-consultation. 68 % of the satisfaction can be explained accordingly. In contrast primary care patients need understanding and clarity for a satisfying doctor-patient-consultation. With this model, 74 % of the satisfaction at the primary care unit can be explained.

Patients profit from the utilization of the VUCA solutions during the doctor-patient-consultation as cognitive closure and increased satisfaction are offered.

1. Introduction

Medicine tends to operate with a cause-and-effect principle. A disease causes specific symptoms which are treated with a correctly chosen therapy. Bodily dysfunction or organ damage are therefore seen as the direct effects of trauma and disease. In short, a specific bodily cause leads to symptoms, which can be diagnosed using the right tools and knowledge and thereafter treated, in the best-case scenario.

Identifying bodily dysfunction or organ damage as the main cause of pain and symptoms is the core statement of the so-called biomedical model. [1]

Keeping this approach in mind, patients visiting an outpatient clinic or medical practice due to bodily symptoms or pain are a logical consequence. A direct effect of the biomedical model is the medical staff's expectation of bodily dysfunction as the main reason for consultation.

In the 1970s the biomedical model was harshly criticized by George Engel, an American pathologist, and psychiatrist. Engel postulates that disease roots in more than merely physical dysfunction. [1] Individual life involves not only biological but also psychological and social dimensions. Physical dysfunction and suffering are therefore caused by a complex combination of biological, psychological, and social aspects. The need for social acceptance, psychological and biological well-being must be considered in a medical environment. Engel titles his approach the biopsychosocial model. [1]

Through the introduction of the biopsychosocial model a doctor-patient consultation gains depth of reasoning.

Patients' decisions of seeking consultation in a doctor's office or outpatient clinic should therefore not merely be seen as reactions to occurring physical symptoms such as pain or discomfort. Rather reactions to accompanying emotions of varying cause need to be taken into consideration. Mainly uncertainties regarding symptoms, diagnosis, therapy options, healing process or future impairment are prevailing. But as diverse as the patients present themselves, as multilayered is the reasoning for consultation. While some are especially plagued by uncertainty, others undertake thorough research prior to their appointment but fail to obtain relevant

information or are confused by the complexity of their situation and ambiguous surroundings. The decisional process seems to overwhelm many.
The diversity of the patient clientele regarding these psychosocial factors as well as the ethnic background explains the necessity for an individual approach for each doctor-patient consultation and stands diametrically opposed to standardized medical procedures.

The acronym VUCA first established in the late 1980s in the United States Army War College describes situations with various possibilities, influences, and uncertain development. [2] It is used in a wide field of expertise, from economics through science to describe change and turbulence and is especially utilized in leadership positions. [3]
VUCA as an acronym stands for volatility, uncertainty, complexity, and ambiguity. Aspects which seem to describe the hyper-volatile, uncertain, complex, and ambiguous situation each patient experiences in a medical environment quite fittingly. [4]

1.1 The biopsychosocial model

The medical world of the second half of the twentieth century was shaped by the biomedical model. The disease was seen as the effect of physical malfunction and biomolecular dysfunctional causes. This principle was also utilized for the description of mental illnesses, which were understood as causal of brain injuries and malfunction. A solely somatic approach to psychiatric impairment. The mind-body dualism, as the separation from physiology and psychology, was propagandized. Natural science was enough to explain the heart of disease and established as solely scientific. While doctors were gradually the first to accept this form of thinking into their ranks, the general population gradually followed. Especially in western society the biomedical model was and is popularized. And even today western approach on mental disease and health has merely changed. Those suffering from mental impairment still face a wall of silence and prejudice when opening up about their struggles. [1]
In his paper “The need for a new medical model: a challenge for Biomedicine” Engel takes the reader on a journey through the evolution of biomedicine, its flaws, and

how to overcome the established scientific system. [1] When biomedicine fails to address the psychological and social needs of its patients, the healing process and doctor-patient-relationship are disturbed as well. It goes as far as sustained patienthood after biomedical recovery, because of patients' variances in psychological and social factors. Treatment of a patient with sole reliability on technical procedures and laboratory values, while bypassing patients' verbal accounts, therefore cannot be seen as a satisfactory solution. To understand patients' impairment the physician not only needs to focus on the biomedical grievances of the patients, but also on patients' psychological experiences and verbal accounts of the impairment, as well as their social context and society's way of coping. The answer is the biopsychosocial model. It provides treatment for sickness by restoration of health and aids to maintain it. When physicians show interest in their patients, as well as an understanding of their biomedical, psychological, and social struggles a qualitative doctor-patient-relationship can be established. When treatment centers excel in biomedical treatment, they often show higher weakness in profound patient care, due to their limited education in human behavior and psychological as well as social aspects of disease. [1] For Engle, the focus of medical education lies in curing patients, which includes the personal aspects of psychology and social surrounding of the illness. The division is also found in the healthcare environment, where physicians are seen as the source of biomedical treatment, while other health professions practice the caring aspect of disease management. Patient care should rather be a shared collaboration of the different health professions to achieve biopsychosocial health, than a division of responsibilities. Because physicians focus on the biomedical aspect of disease, a discrepancy between patients and physicians develops. While patients experience their physical complaints mainly in a psychosocial context of impairment, the physicians' focus lies on the diagnosis, relying on technical methods rather than patients verbal accounts, and treatment of the physical dysfunction. To be able to address the developing discrepancy, physicians need to gain an understanding of the biopsychosocial dimension of disease as well as develop skills for addressing and releasing psychosocial ambiguity. By listening to and addressing patients' complaints accordingly, a better understanding of the dimensions of the presented disease can be acquired. It is crucial to note that the different aspects of the biopsychosocial model affect each other. Only the wholeness and well-being of each

aspect lead to complete health. The dynamic balance between function and disruption provides the key to the understanding of health and disease. [1, 5] Since the publication of Engel's paper "The need for a new medical model: A challenge for biomedicine" in 1977 the biopsychosocial model has found its way into medical education and slowly into the hospital environment, leading to a more empathetic approach to disease management. Patients are generally viewed with a holistic approach and the biological, psychological, and social dimensions of a patient's well-being are considered. Studies, especially for psychiatric patients, stress and in neurology, show improvement in treatment by utilizing the biopsychosocial holistic approach. [1]

But the model has been criticized as well. A lack of theoretical framework for the precise function and application of the model, as well as the problem of assigning responsibilities and education of health care professionals, are frequent. Some argue that the model is not scientific, does not specify how the biological, psychological, and social aspects interact and lead to disease, and offers no direct therapeutic treatment scheme. But the biopsychosocial model leads to a patient-centered medicine by connecting the scientific aspect of medicine with the focus of treatment, the patient with biological, psychological as well as social dimensions. [6]

Not only psychiatry was conquered and converted to the biopsychosocial model, but other aspects of medicine as well. Chronic pain for example is, in contrast to acute pain, associated with a long timeframe of painful events and affects the psychological and social aspects of life due to impairment. Therapeutic aspects of chronic physical pain, therefore need to include the biological, psychological, and social aspects of a patient's experience for successful treatment. [7] Cicely Saunders, a trained nurse, social worker, and physician with strong personal faith, worked with terminally ill and dying patients and criticized the cold approach to this specific patient clientele. She understood pain as the key to multiple further complications and the requirement to address them with specific interventions for a resolution. Saunders developed the model of "total pain". For Saunders dying patients experience pain not only on a physical level but also psychological, social as well as emotional, and spiritual elements are included. With the help of the total pain model, the hospice clinical practice was established. [8] Quality of life in palliative care is described with the help of the biopsychosocial model as well. To achieve the best possible quality of life, even with a terminal disease, physiological,

psychological, social, and spiritual qualities have to be established individually for each patient and maintained or individually changed with the progression of the disease. [9] The biopsychosocial model is widely utilized today in various disciplines of medicine and helps to establish a trustful doctor-patient-relationship, a patient-centered treatment, and patient satisfaction. [10]

1.2 VUCA

Because of the worldwide alterations following the end of the cold war, the US Army War College felt the need for a better description model of changing environments. Thereby, the acronym VUCA was introduced in the1990.[2] VUCA is an acronym for volatility, uncertainty, complexity, and ambiguity. The US Army War College described the world we live in as volatile, uncertain, complex, and ambiguous. It was and still is understood, that community, as well as military leaders, need to operate with the understanding of the VUCA environment to practice successful leadership. After the terrorist attacks of September 11, 2001, VUCA became more widely known and utilized. [2] Especially business leaders and the world of economics latched to the concept, due to the rapidly changing and insecure environment the business world has morphed into. But crisis leaders in general, as well as the healthcare industry and especially doctors, adapt and utilize VUCA on an increasing level. It is just a sidenote to mention the financial crises of the first decade of the 2000s. As our world evolves with populational rises and an ever-aging people, new technological developments surging and global disasters disrupting communities, the need for competent and trustworthy leadership increases accordingly. VUCA offers a unique opportunity for leadership development as it not only aids in the understanding of turbulent surroundings but also guides the leaders with its solutional approaches to develop more flexible and adaptable solutions. [3]

As it is now established how and why VUCA developed and what the acronym stands for, how each VUCA aspect is defined and in what way VUCA offers a solution to the stated problems still needs clarification. [3]

The V in VUCA stands for volatility. Volatility is described as turbulence evolving with an unpredictable pattern, or the nature and dynamics of change. Since changes occur more rapidly in recent years overall volatility is on the rise in the financial market, the military as well as healthcare. [4]

The U in VUCA means uncertainty. Uncertain environments are lacking predictability. Because volatility increases past events become less trustworthy as predictors for future events, a rising challenge for forecasting and decisional processes. [4]

C in VUCA stands for complexity. Each predicament is multilayered with causes and entwined yielding factors, leading to difficulty in understanding the core aspects and the right way for addressing the issue properly. [4]

The A in VUCA is defined as ambiguity. Often clarity is lacking regarding the meaning of events happening. The causes are uncertain and difficult to interpret.

Because volatility adds turbulence to change, predictions of future events based on past happenings are more untrustworthy leading to the increasing difficulty of decision making. The result is confusion, which is a direct cause of ambiguity. [4]

While leaders need to learn to distinguish the VUCA factors in an event, VUCA also offers skills to address the particularly volatile, uncertain, complex, and ambiguous situations accordingly. Johansen coined the term VUCA prime, in this work they will be called the VUCA solutions. Where there is volatility, a vision is required. Uncertainty can be answered with understanding. Complexity is addressed by clarity and ambiguity is resolved by using adaptability. The VUCA factors or problems yield the VUCA solutions. [11]

The VUCA solutions are a skillset that leaders need to introduce into their leadership vocabulary to navigate the increasingly turbulent and dynamic times. [3]

Vision offers a clear mindset and planning skills for deciding where the focus of a company, country, or hospital should be lying in years ahead and what goals are to be achieved. [4]

Leaders need to gain the ability to understand their surroundings at any given moment by reflecting on what is occurring and how the situation affects their area of expertise. The importance is the ability to look beyond and understand one’s own expertise. [4]

Clarity is described as a deliberate process, which allows leaders to introduce sense into chaotic situations. By understanding and categorizing chaos leaders can determine various aspects of difficult events and form informed decisions for achieving the attempted solution. [4]

Adaptability enables leaders to react quickly and with precision to change. It involves cross-organizational as well as clear communication, and collaborations are vital

aspects in complex situations, and the flexibility to apply the right solution at any given moment. [4]

Leading with VUCA comprises foresight and flexibility, as well as self-awareness and open-mindedness in trying situations and the ability to rather look beyond a function onto the bigger picture. [3, 4] Alkhaldi et al. summons the task of a leader with

"(1) anticipating and reacting to the nature and speed of change; (2) acting decisively in the absence of clear direction and certainty; (3) navigating through complexity, chaos, and confusion; and (4) maintaining effectiveness despite constant surprises and a lack of predictability." [3]

As mentioned above, the VUCA world with its VUCA factors and VUCA solutions helps leaders in various fields of expertise to establish a more sophisticated and reliable form of leadership. Healthcare is seen as a volatile, uncertain, complex, and ambiguous surrounding by healthcare workers and patients alike. It is, therefore, unsurprising that the VUCA concept gained innumerous popularity in this specific area, especially with the hitting Covid-19 wave. Medical practitioners are trained to adapt to the VUCA environment surrounding them and to address the resulting problems with the according VUCA solutions. [3]

But patient centered VUCA research is scarce. It is not clear whether patients experience the healthcare environment as volatile, uncertain, complex, and ambiguous, even though it can be assumed as true. That is why this work will concentrate on evaluating if patients visiting a hospital experience or struggle with the VUCA factors and if the VUCA solutions may offer a key for increasing patients' satisfaction with a doctor-patient-consultation.

1.3 Acute and Chronic Pain

A definition of pain and the differences between acute and chronic pain are subject of the following subchapter.

Patients with elective appointments are mostly those suffering from pain and impairment for a longer period of time, while patients at the primary care unit often experience acute traumatic injuries with a shorter timeframe of pain. It is not the subject of this work to distinguish between primary care patients without longer impairment and those evolving to become chronically impaired.

The International Association for the Study of Pain (IASP) defines pain as
"an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage." [12]
Further, the IASP adds six key notes for context:
"Pain is always a personal experience that is influenced to varying degrees by biological, psychological, and social factors.

Pain and nociception are different phenomena. Pain cannot be inferred solely from activity in sensory neurons.

Through their life experiences, individuals learn the concept of pain.

A person's report of an experience as pain should be respected.

Although pain usually serves an adaptive role, it may have adverse effects on function and social and psychological well-being.

Verbal description is only one of several behaviors to express pain; inability to communicate does not negate the possibility that a human or a nonhuman animal experiences pain." [12]

As mentioned above pain can be divided into two different forms depending on the prevailing timespan of occurrence. Acute pain is defined as pain lasting no longer than three months. The experienced pain usually resolves with the completion of the healing process. Acute headache, due to migraine or tension, and lower back pain are worldwide under the top ten most common health impairment conditions. Chronic pain on the other hand lasts per definition three to six months or even longer. Chronic pain is ranked under the top ranked conditions for life with a disability. [13]
Since pain is a subjective experience rather than an objective measurable trait, pain scales were introduced to assess pain intensity and for comparison, since the different scales show high intercorrelation. Different scales are available for pain-intensity assessment from visual analog scales, and numerical rating scales to verbal rating scales and pain drawing. [14] For this study, the numerical rating scale for the measurement of pain-intensity was chosen.

1.4 Aim

The study aims to evaluate if VUCA-specific psychosocial factors occur with patients and if VUCA-specific solutional approaches correlate with an individualized, satisfactory doctor-patient consultation.

In a cross-sectional designed study expectations of first-time orthopedic and traumatological patients visiting with elective appointments and primary care patients are analyzed. Thereby the focal point is set on the individuals' expectations regarding the doctor-patient consultation.

A differentiation between specific disease patterns will not be made. Rather the psychological aspects of an outpatient department visit are collected and examined. The focus is specifically set on the aspects affecting patients' expectations and possible differences between social collectives.
The aim is to thereafter utilize the evaluated results to improve the overall quality of treatments and subjective patient satisfaction.

Out of these stated aims, the following hypotheses are formed:

I. Do orthopedic patients live in a VUCA-world?

   Null hypothesis:
   There is no correlation between demographic factors and the basic psychosocial factors of a VUCA situation. (Intercorrelation analysis)

II. Do differences in patients from the orthopedic outpatient department and the primary care unit occur?

   Null hypothesis:
   No statistically significant differences between patients at the orthopedic department for elective appointments and the primary care unit occur.

III. Do the VUCA-factors volatility, uncertainty, complexity, and ambiguity show an intercorrelation?

Null hypothesis:
The individual VUCA -factors show no statistically significant intercorrelation.

IV. Are patients more satisfied after a doctor-patient consultation, if specific selected VUCA-solutions are discussed?

Null hypothesis:
The correlation between VUCA-solutional approaches and satisfaction after the doctor-patient consultation is not dependent on the addressing of VUCA-solutions. (Correlation)

V. Can patients' satisfaction with the doctor-patient consultation be explained by applying the VUCA solutions?

Null hypothesis:
VUCA solutional approaches show no influence on patient satisfaction with the doctor-patient consultation. (Multivariate linear regression analysis)

2. Materials and Methods

2.1 Study design and study procedure

The prospective cross-sectional designed study was conducted at the Medical University of Graz department for orthopedics and traumatology.

Intended as an observational study the cross-sectional designed style allows researchers to gather a sample at a single moment in time without the need for a follow-up. Therefore, data can be collected within a short period and inexpensive way. [15]
The study design allows measurement of patients' expectations and the correlating outcome of the doctor-patient consultation during the visit to the selected outpatient department.
Out of the general hospital patient population study participants were selected through specific inclusion and exclusion criteria (see pages 27ff for more detailed information), determined at the beginning of the study. [16]

A total amount of 200 patients were surveyed between August 10th, 2020, and December 30th, 2021, from the orthopedic department for elective appointments and the primary care unit. The sample was thereby divided into two separate groups, 100 first-time visiting patients from the orthopedic outpatient clinic and 100 patients from the primary care unit, seen as first time visiting with their specific impairment.
A focus point was set on first-time patients as well as those who visited with a referral from an orthopedic specialist. It was possible to differentiate between first time patients and scheduled control appointments via entries in the hospital information system openMEDOCS.
All patients with an initial visit to the outpatient department who fulfilled the inclusion criteria, and no exclusion criteria were recruited for the survey.
If participating, patients were approached by authorized medical personnel. After a medical educational talk, the recruited individuals were asked to sign an informed consent. With assigning the participant a specific number ranging from one to 200, a Patient ID was encrypted. A data cloud within the online platform REDCap®,

licensed for the Medical University of Graz, was created. Data collection was conducted using the app version of REDCap®, which enabled study staff to monitor the whole interrogational process on a separate tablet or computer to avoid the accumulation of missing data. Only study staff was allowed access to the password secured survey tools, which ensured patients' privacy. With the help of pain and physical function scales as well as psychosocial and expectational questionnaires patients' specific VUCA-associated factors and the correlating physical impairment could be explored.

After the doctor-patient consultation, an evaluation of the individual fulfillment of a patient's expectation and its correlation with subjective patient satisfaction was obtained.

2.2 REDCap®

The following section is mainly based on [17].

Because of the sheer amount of collected data resulting from 13 questionnaires and 200 patients as the study population, there was a need for a reliable data cloud system.

Even though a significant rise in the importance of national and especially international collaborations was experienced in the scientific research world, the ability to share data and storage systems was still lacking in the early 2000s. Customized clinical research software applications were difficult to share with partners worldwide due to differences in IT configurations. Not the lack of willingness to share customized codes, but the effort needed to generalize the applications led to the main struggles.

In 2004 Vanderbilt University in Nashville, Tennessee decided to address the issue. A clinical and translational research group needed a secure data collection tool. The resulting product was REDCap®.

REDCap® is an acronym for *"Research Electronic Data Capture"* [17].

It *"is a secure web application for building and managing online surveys and databases, designed to support data capture for research studies"* [17].

The possibility of centralized data collection, as well as the opportunity to support different forms of study designs and the chance to share research was what helped

REDCap® to its popularity. With this study, the feasibility of obtaining and storing multiple and variant answers from patient questionnaires seemed crucial.
Within a REDCap® account, various research fields and sources of research data can be stored in subgroups, and the personnel requirements are thereby limited.
In 2006 Vanderbilt University started to share the REDCap® tool with software collaborators and consortium partners.
Since then, the REDCap® consortium has enjoyed widespread popularity as there are over 3200 REDCap® partners in more than 128 countries. The Medical University of Graz has a licensed user permit, which is why this study was created with the help of REDCap®. Only study staff was allowed access to the password secured survey developed with REDCap®, thereby ensuring data security and privacy.
Access to REDCap® can be limited, where U.S. export control laws make licensing impossible. Regions with limited internet connectivity or government-imposed internet restrictions may be prohibited from using the application.

2.3 Patient Questionnaires

The main study goal was to research if VUCA-specific psychosocial factors can be found in patients. To obtain the needed data patients were asked to participate in an on-campus online survey.
A total amount of 13 different questionnaire files were included in the survey.
First, the inclusion and exclusion criteria were evaluated. If a patient fulfilled the requirements the survey process started. Within the study, this part was called screening.
Because of the variety of patients visiting the orthopedic department for elective appointments and the primary care unit regarding age, gender, income, marital status as well as pain levels, and types of injury, demographical data were evaluated next. Patients were asked to state an email address as the last two questionnaire parts, the Post Interventional Survey and patient satisfaction, needed to be concluded after the doctor-patient consultation. The email address helped ensure a higher response level. For a larger part of the study, questioning patients on those

last questionnaire parts in the outpatient department posed a difficulty due to a lack of time.

The demographic questionnaire part was titled enrollment. The demographical data included the date of birth; gender; height, and weight, to calculate the BMI; level of education in years, for example, compulsory schooling (8 years), apprenticeship/vocational school (10-12 years), high school degree (Matura) (12 years), bachelor's degree (15 years), master's degree (17 years), Ph.D. (20 years); professional status; early retirement procedures or certificate of disability; marital status and living situation; smoking; alcohol and annual gross salary. Injury-related data was evaluated as well, including the examination date; place of examination (either orthopedic department for elective appointments or primary care unit); course of injury (traumatic or atraumatic); date of injury; body region and medical referral from family doctor or specialist.

As stated above different patients with various forms of injury and pain levels participated. Therefore, three specific standardized pain scales were introduced to obtain knowledge of a person's pain level.

As measuring scales recording the everyday physical function of chronic patients and their treatment outcomes were scarce in early 2000, the US-based National Institutes of Health (NIH) developed the *"Patient-Reported Outcomes Measurement Information System short PROMIS"*[18]. PROMIS allows healthcare workers as well as clinical researchers a measurement tool for reporting symptoms, physical function, and quality of life factors for patients with chronic disease and physical impairment. With the help of computerized adaptive tests (CAT), scales can be evaluated immediately using web applications, such as REDCap®, which automatically calculate the scores. Results are evaluated in reference to the US general population with a standardized score of 50 and a standard deviation of 10. A wide range of different PROMIS scales is available today. This survey utilized the PROMIS Scale v1.0 - Pain Intensity 3a and the PROMIS Bank v2.0 - Physical Function. [18]

The pain intensity was evaluated by using the PROMIS Scale v1.0 - Pain Intensity 3a, which was developed to report the whole range of possible pain intensity. Since there is no objective way to measure a person's pain intensity, pain scales are used for comparison. This scale persisted of questions about the maximum and average pain in the last seven days as well as the current pain level during the evaluation.

Patients were asked to rate their pain intensity on a scale from 1 (= had no pain) to 5 (= very severe pain). For interpretation, the scale is standardized for the US population with a score of 50 and a standard deviation of 10. Measurements above 50 indicate higher levels of pain intensity than the general US population experiences and scores below 50 indicate less experienced intensity of pain than the US general population. [19]

The second questionnaire called PROMIS Bank v2.0 - Physical Function was selected to evaluate functional impairment due to injury and pain. Questions regarding the restriction of physical function related to the injury were stated. The order and type of questions varied, depending on participants' responses to the question, due to the use of a computerized adaptive test (CAT). The system thereby chooses subsequent item questions from the full item bank of 165 items to determine the degree of impairment. PROMIS scores are comparable even though questions differ. Mainly physical impairment during self-care, walking, and household and garden chores were evaluated. A score of 50 (std. 10) is the average standardized score for the general US population. Scores above 50 therefore imply higher rates of physical function than the US general population, while scores lower than 50 correlate with higher impairment in physical function. [18, 20]

The maximal amount of pain in the last few days was assessed using a numerical rating scale (NRS) for pain with values from zero to ten. Zero implied no pain and ten was the worst pain imaginable.

To evaluate the patient-related VUCA factors, volatility, uncertainty, complexity, and ambiguity, specific standardized psychosocial questionnaires were selected. By using standardized questionnaires, we were able to generate comparable results. Each VUCA factor was assessed separately with a specific questionnaire.

The volatility of the orthopedic sample patients was analyzed using the acceptance and action questionnaire II (AAQ-II), which evaluates mainly painful memories and emotions. The Acceptance and Action Questionnaire is a regularly used measurement tool in psychology that evaluates a person's avoidance strategies regarding thoughts or feelings and psychological inflexibility, subsumed as a person's experiential avoidance. It is especially applied in modern cognitive behavioral therapy. With the AAQ-II scores predictions on various outcomes, such as mental health to work absence, can be obtained. Higher scores imply increased levels of psychological inflexibility and avoidance, leading to elevated emotional

distress and decreased functionality in everyday life. Bond et al. define a score range of 24 to 28 for the AAQ-II, which indicates psychologically relevant distress levels. In the survey participants without psychological illnesses showed scores around 18, while participants treated for substance abuse presented score levels around 28. [21]

To evaluate the VUCA problem uncertainty the short version of the Intolerance of Uncertainty Scale (IUS-12) was selected. The Intolerance of Uncertainty Scale was first introduced in 1994 by Freeston et al. for the measurement of intolerance of uncertainty. [22] The differences in discriminating individual forms of excessive worrying or anxiety and their relation to anxiety pathologies are defined as Intolerance of Uncertainty. Impairment in problem-solving strategies is directly correlated with intolerance of uncertainty. Ambiguity, whether in information or situation, is thereby seen as threatening. While fear leads to a physical reaction, like increased blood pressure or heart rates in the sense of a fight or flight mode activation, worry is usually accompanied by few physical symptoms. People with higher levels of intolerance of uncertainty on the other hand show associations with physical stress reactions. The Intolerance of Uncertainty scale helps to assess patients' levels of intolerance of uncertainty and their reactions to ambiguous situations in the present and future. The IUS-12 is a shorter 12 items version of the original IUS with 27 items. The IUS-12 was published by Carleton et al in 2005 and shows a high correlation with the original version. [23] According to Wilson et al., the IUS-12 can be seen as a reliable tool for the diagnosis of the generalized anxiety disorder (GAD) in patients. GAD is thereby defined as: *"excessive anxiety and worry, in that the worry is multifocal and difficult to control"* [24]. Scores of 28 and above are suggested as a cut-off score for distinguishing patients with GAD from healthy people. [24] In the study scores above 28 were seen as proof of the intolerance of uncertainty experienced by the sample and therefore confirmation of the existence of the VUCA factor uncertainty in the sample.

The Need for Cognitive Closure scale (NCC) was chosen to evaluate complexity. Webster et al. define the need for cognitive closure as *"persons' motivation with respect to information processing and judgement"*. [25] Earlier on Kruglanski et al. identified the need for closure as a desire for a clear answer to a subject without the

turmoil and ambiguity caused by just any answer. [26] The desire to predict the outcome of a situation as well as to take specific actions regarding a situation or problem increases the need for cognitive closure. It is suggested that the need for cognitive closure varies depending on the situation, but also individual differences are recorded. People show a tendency of reacting negatively about disruptions on their way to cognitive closure, this may include negative reactions to people as disruptors as well. The Need for Cognitive Closure scale was originally designed as a questionnaire including 42 items and evaluates the individual differences in need for cognitive closure. The preference for structure in everyday life, the aversion to ambiguity, the need for closure in decision-making as well as the desire for stability and security in knowledge are evaluated. Scores under 82 resemble a low need for cognitive closure, while scores between 205 and 246 mean high levels of need for cognitive closure. [27, 28] Schlink et al. created a German version of the Need for Cognitive Closure Scale (16-NCC), which is with 16 items, shorter than the original one. The 16-NCC evaluated 16 items using a Likert scale ranging from 1 for strong disagreement to 6 for strong agreement. [29] Following Kruglanski et al. scores were adapted for the interpretation of 16-NCC with scores between 16 to 32 indicating low levels of need for cognitive closure and scores ranging from 80 to 96 suggesting a high need of cognitive closure. Scores above 80 were interpreted as confirmation of the existence of problems with the VUCA factor complexity in the sample patients. [25, 28]

To assess the VUCA problem ambiguity the Intolerance of Ambiguity Scale (IOA) was chosen. Stanley Budner published the scale in 1962 at the N.Y. State Psychiatric Institute. Budner defined intolerance of ambiguity as *"the tendency to perceive (i.e., interpret) ambiguous situations as sources of threat"* [30], while he established that tolerance of ambiguity is *"the tendency to perceive ambiguous situations as desirable"* [30]. Ambiguous situations are those perceived as chaotic or incomprehensible, and the individual struggle to structure and categorize them. Budner identifies three key situations of increased ambiguity. First, new situations are identified as unfamiliar, second, complex scenarios with a multitude of impressions needing to be reflected on and third, contradictory situations. Budner describes the dilemmas in short with *“novelty, complexity, and insolubility”* [30]. For Budner reactions to threatening situations can be divided into two categories,

namely submission, and denial. He defines submission as *"the recognition of the situation as an ineluctable fact of existence which the individual cannot alter"* [30] and denial as *"the performance of some act by which the objective reality, even if only in the phenomenological world of the individual, is altered to suit the desires of the perceiver"* [30]. People feel threatened if they experience one of the four possible responses to a situation, *"phenomenological denial (repression and denial), phenomenological submission (anxiety and discomfort), operative denial (destructive or reconstructive behavior), or operative submission (avoidance behavior)"* [30]. In contrast, DeForge et al. suggest that people with a tolerance of ambiguity tend to exhibit elevated levels of positive traits, such as open-mindedness, originality, creativity, and the motivation to consider circumstances from various perspectives. [31] The Intolerance of Ambiguity scale consists of 16 Items, which offer a whole score for interpretation, as well as an individual score for the three different situations separately. Budner recorded mean scores between 44 and 53 for the Intolerance of Ambiguity Scale from different samples. [30] DeForge et al. questioned medical students at different educational levels, to try and establish if medical students show higher levels of intolerance of ambiguity. They found mean scores ranging from 49 to 54, which are slightly higher than the mean scores published by Budner. [31] The Ohio Child Welfare Training Program offers the Intolerance of Ambiguity scale for measurements, as well as interpretational scores concerning Budner. Typical scores range from 44 to 48, with higher scores implying lower levels of intolerance of ambiguity. Values above 48 in this study were seen as confirmation of the intolerance of ambiguity and therefore proof of the VUCA factor ambiguity in the sample. [32]

The above-mentioned Post Interventional Survey consisted of four questions regarding the fulfillment of the VUCA solutions and a scale evaluating patients' satisfaction with the doctor-patient consultation using a Likert scale from zero to ten completed the survey.

The last two questionnaires (Post Interventional Survey and Satisfaction) could be completed via email at a later moment, as most patients were eager to leave the outpatient department after the doctor-patient consultation and a higher response rate was generated accordingly.

To evaluate people's opinions, interests, as well as their fulfillment, and satisfaction regarding the medical procedure Likert scales were introduced. Especially the fulfillment and satisfaction surveys were based on individually developed Likert scales. Within the Likert scale a statement is made and an answering scale ranging from strongly agree to disagree or a numerical scale from zero to ten is offered, which can be rated individually varying from patient to patient. [33]

To measure patients' feeling of fulfillment with the VUCA solutions during the doctor-patient consultation an individually developed Likert scale, concentrating on patients' satisfaction, with answering options from very important to not necessary, was used. The Likert scale was developed in a collaboration of study staff members. The four main questions were:

- VISION: How satisfied were you with the drawn picture of your future possibilities by your doctor during the consultation?
- UNDERSTANDING: How important was the obtainment of information and understanding of connections through the consultation for you?
- CLARITY: Where you able to access main information and clarity throughout the consultation?
- ADAPTABILITY: Are you able to better adapt to your situation with the doctor-patient consultation?

Patients' satisfaction was evaluated with the collaboratively established new Likert scale and the question: "How satisfied are you with the doctor-patient consultation?" and rated from zero to ten, with ten meaning total satisfaction and zero not satisfied at all.

2.4 Patient recruitment

A total amount of 200 patients were included in the clinical trial between August 10^{ths} 2020 and December 30th, 2021. Recruitment was conducted at the Medical University of Graz, Department of Orthopedics and Traumatology. As the main goal was to evaluate differences between patients for elective orthopedic appointments, mainly patients with chronic impairment, and patients at the primary care unit, recruitment was divided between those disciplines. 100 patients were questioned at elective orthopedic appointments and the other 100 at primary care visits.

From all patients scheduled for elective orthopedic appointments only first-time visiting patients were recruited. At the registration desk first-time visiting patients were determined with the help of the hospital information system openMEDOCS and in case of uncertainty questioning of the patient.

Surgical emergency patients and those without an appointment are treated at the primary care unit. Since patients admitted here come with recent injuries, a selection regarding first-time patients with an injury was more easily done. There are only a few follow-up examinations, which are documented in the patient file and therefore quickly extracted.

After the first selection process patients were individually asked by the study staff to participate in the study.

In writing, patients were informed of the aims of the clinical trial as well as their data being used in an indirect personal form. Patients were informed that medical data, such as name, date of birth, social security number, phone number, address, and medical history, may be viewed via the openMedocs-System used by KAGES. With signing the informed consent patients confirmed their consent on the data collection and saving of necessary information using REDCap® regarding the study, as well as their use and anonymized publication. After signing the information sheet, the survey process unfolded. Each participant was assigned a number that replaced the name and enabled the strict confidentiality of personal data. Personal information such as name, age, and email address linked with the assigned number was saved individually in a password-secured document, ensuring strict confidentiality of personal data. The patient's ID was thereafter encrypted, and a record was created within REDCap®.

With a patient's consent, the screening process for inclusion and exclusion criteria followed. Included patients were those with first-time elective appointments and the primary care unit, who were in accordance with the inclusion criteria.

These inclusion criteria contained:

- Patients were 18 years or older at the time of the survey,
- were first-time visitors to the orthopedic department for elective appointments or the primary care unit,
- are fluent in German,
- and signed the informed consent.

Patients were excluded when declining consent or not suited because of fulfilled exclusion criteria.

The exclusion criteria are as followed:

- Limited ability to give consent due to psychiatric illnesses or dementia,
- parallel participation in another clinical trial with a research focus on biopsychosocial interference and
- polytrauma.

After a successful screening process patients were first asked to complete the demographical data questionnaire followed by the three pain scales. As standardized pain scales were used, which were varying depending on the answer with the PROMIS Bank v2.0 - Physical Function Scale, a translation into German was not expedient. Study staff, therefore, translated these questionnaire parts if necessary. The VUCA-specific questionnaires were answered next. Thereafter a break was introduced, and the doctor-patient consultation followed. Depending on patients' preferences the fulfillment and satisfaction survey parts were either completed right after the final consultation or later via email.

Patients' anonymity and confidentiality was strictly maintained due to the usage of password coded documents. Only study staff was allowed access to the password secured confidential patient information such as email addresses and the encryption documents.

2.5 Statistical Evaluation

The following chapter is mainly based on [34].

Statistical measures, including either mean, standard deviation, or median and interquartile range depending on the level of measurement, were used to describe the main data distribution. Statistical procedures included bivariate analysis, intercorrelation analysis, and multivariate regression analysis regarding patients' expectations and satisfaction as well as intercorrelation between different VUCA factors. The statistical evaluation was conducted by using the statistical online software Stata (https://www.stata.com/).

Please note the chapter Results for a detailed presentation of the results.

The Type I error is set to 0.05.

2.5.1 Descriptive Statistics

With the help of descriptive statistics, collected data can be described and displayed. It is therefore used at the beginning of the data analysis process specially to generate a first overview. Tables and graphs are established as well as calculation of basic statistical measures.

Frequency distributions help to summarize the gathered information using location parameters, such as mean and median, as well as dispersion. Location parameters describe the center of a distribution. As different ways are used to determine this center, a variety of location parameters exist. To characterize the data distribution more successfully dispersion is used. Dispersion indicates how spread the objects are within a data set.

2.5.1.1 Mean and Standard Deviation

2.5.1.1.1 Mean

The mean may only be used for cardinal data, consisting of equidistant intervals, such as temperature, degree of knowledge, or IQ.
Depending on the data two different formulas can be used to calculate the mean.
If a raw data table is available, the mean $\bar{x}$ is calculated with

$$\bar{x} = \frac{1}{N}\sum_{i=1}^{N} x_{i.} \tag{1}$$

N thereby describes the unity and $x_{i.}$ the i^{th}-value of the samples.

If a frequency distribution is used, the mean $\bar{x}$ is calculated by

$$\bar{x} = \frac{1}{N}\sum_{i=1}^{r} x_i \ h_i = \frac{1}{N}\sum_{i=1}^{r} x_i \, p_i, \tag{2}$$

with r describing the quantity of the different domains, h_i the frequency of x_i, and the relative frequency p_i of x_i defined as

$$p_i = \frac{h_i}{N}. \tag{3}$$

2.5.1.1.2 Standard Deviation

While location parameters describe statistical data with a single number, dispersions, such as the standard deviation, provide information about the distance between singular data points. As the standard deviation utilizes the mean for calculation, only the application of cardinal data is permitted.

As the standard deviation is calculated using the variance a definition thereof is necessary first.
The variance s^2 of the attribute x_i is calculated with

$$s^2 = \frac{1}{N}\sum_{i=1}^{N}(x_i - \bar{x})^2. \quad (4)$$

The variance is seen as the mean squared distance of data points regarding the mean.

The standard deviation s is defined with the variance s^2 and is calculated by

$$s = +\sqrt{s^2}, \quad (5)$$

using the positive root.

2.5.1.2 Median and Interquartile Range

2.5.1.2.1 Median

The median can be generated using a data series ordered by size. The most central element of this ordered series is the median if the number of data objects is uneven, otherwise the mean of the two most central elements has to be computed to gain the median.
For an odd-numbered N as the unity with x_i, the attribute at the i^{th} spot of the ordered data series the median $\tilde{x}_{0.5}$ is calculated with

$$\tilde{x}_{0.5} = x_{(N+1)/2}. \quad (6)$$

For an even numbered N as the unity with x_i, the attribute at the i^{th} spot of the ordered data series median $\tilde{x}_{0.5}$ calculation is archived using

$$\tilde{x}_{0.5} = \frac{x_{N/2} + x_{N/2+1}}{2}. \quad (7)$$

The median is interpreted as the value with at least 50 % of data objects smaller and at least 50 % of data objects are greater. It is used for ordinal as well as numerical scales.

2.5.1.2.2 Interquartile Range

Quantiles divide an ordered data series in groups with a specific percentage of data below and above the quantitative value. Quartiles divide the data series in four specifically determined groups. The first quartile includes the first 25 % of data objects and is defined as the 0.25 quantile. The second quartile equals the median, also defined as the 0.5 quantile. The third quartile is the 0.75 quantile, with 75 % of data objects below and the rest above.

An α quantile of the attribute $\tilde{x}_\alpha$ with N as the unity and $x_{(k)}$ as the specification of the k^{th} point in an ordered data series is calculated with

$$\tilde{x}_\alpha = x_{(k)}, \quad (8)$$

if $N \cdot \alpha$ does not result in a whole number. k is then defined as the following whole number.

If $N \cdot \alpha$ results in a whole number

$$k = N \cdot \alpha, \quad (9)$$

and the α quantile of the attribute $\tilde{x}_\alpha$ with N as the unity and $x_{(k)}$ as the specification of the k^{th} point in an ordered data series is defined as

$$\tilde{x}_\alpha = \frac{1}{2}\left(x_{(k)} + x_{(k+1)}\right). \quad (10)$$

2.5.1.3 Bivariate Analysis

With the help of a survey unit, various attributes can be evaluated. Observation of single attributes would lead to univariate analysis. In contrast, a bivariate analysis focuses on two different attributes and their connection.

The bivariate data analysis specifically employs contingency tables. Attributes need to be collected into groups with a few different characteristics.
To describe a quantitative connection between two attributes of a sample bivariate analysis works specifically with correlation and regression.
The graphic description employs scatterplots to depict specific data.

2.5.1.3.1 Correlation

Correlation analysis evaluates the potency of the connection between two attributes. Several requirements should be fulfilled for the calculation of correlation analysis. Both attributes need to be quantitative data. The connection of the attributes must be linear, which can be observed using a scatterplot. Both attributes are independent of each other.
There are two different types of correlation measures, Spearman's rank correlation coefficient, and the Pearson correlation.

Spearman's rank correlation coefficient is calculated using ordinal attributes. After creating an ordered data series, the Spearman correlation coefficient p_s is calculated. With N as the unity and d_i the ranking difference between r_i and s_i of the i^{th} entity (r_i thereby describes the number of X attributes and s the number of Y attributes) p_s results in

$$p_s = 1 - \frac{6 \cdot \sum d_i^2}{N \cdot (N^2 - 1)}. \tag{11}$$

To calculate the Pearson correlation coefficient, which is used for numerical data and linear correlation, the covariance needs to be calculated first. The covariance quantifies the linear connection between two different attributes.
The covariance s_{XY} is calculated by

$$s_{XY} = \frac{1}{N} \cdot \sum_{i=1}^{N} (x_i - \bar{x}) \cdot (y_i - \bar{y}), \tag{12}$$

with $-\infty \leq s_{XY} \leq \infty$.
The two-dimensional numerical attributes are described by x_i and y_i, and the mean by $\bar{x}$ and $\bar{y}$.

With the help of the covariance s_{XY} and the standard deviation s_X of the attributes X and the standard deviation s_Y of the attributes Y, Pearson's correlation coefficient p is calculated with

$$p = \frac{s_{XY}}{s_X \cdot s_Y}, \tag{13}$$

with $-1 \leq p \leq 1$.

Spearman's rank correlation coefficient, as well as the Pearson correlation coefficient, can be interpreted by considering the algebraic sign and the amount of the solution. If $p < 0$ the two attributes are negatively correlated. No correlation can be found when $p = 0$. Both attributes are positively correlated when $p > 0$. The correlation's direction is determined by the algebraic sign.

2.5.1.3.2 Regression Analysis

To describe the influence of different attributes on a response variable regression analysis is used. It draws a connection between the cause and effects of specific attributes. As there are many different regression analyses depending on the number of variables and the characteristics of the attributes only the basics of linear single regression will be covered here.

The linear single regression is calculated by

$$f(x) = y = a + b \cdot x. \tag{14}$$

The two-dimensional numerical sets of data are described with an independent variable x and a dependent variable y, the intercept a, and the slope b.

The minimal distance square estimations of a and b, which are used to construct the linear regression line, are

$$\hat{b} = \frac{s_{XY}}{s_X^2}, \tag{15}$$

with the covariance s_{XY} and the standard deviation of the attributes s_X and

$$\hat{a} = \bar{y} - \hat{b} \cdot \bar{x}, \tag{16}$$

with $\hat{a}$ and $\hat{b}$ as estimators and $\bar{y}$ as mean.

2.5.2 Inductive Statistics

Inductive statistics allows to draw statistical conclusions from a sample to the population. This contains a certain amount of uncertain yet manageable factors.
The two statistical subdivisions used by inductive statistics are estimation and testing based on a sample from a population. A representative sample needs to be provided for the usage of inductive statistics.

2.5.3 Explorative Statistics

Explorative statistics is set between descriptive and inductive statistics. Explorative statistics evaluate possible patterns which help create scientific questions and hypotheses. As its own statistical field, it uses inductive statistics to evaluate findings and hypotheses.

2.6 Missing Data

As missing data may lead to issues regarding data analysis, it was vital to try and minimize data loss as best as possible. As the patients completed the survey on iPads using REDCap®, data loss was prevented with the REDCap® tool itself as well as monitoring study staff. REDCap® marked missing data and asked the study participant to complete the survey adequately. At the end of each specific survey section, study staff needed to evaluate the completeness of the answers given. Furthermore, study staff was able to oversee the data collection process on a separate web tool and intervene if missing data submerged.

A difficulty posed the fulfillment and satisfaction survey, as they needed to be completed after the doctor-patient consultation. The first attempt for completion consisted of printed questionnaires, which had to be dealt with right before patients were leaving the outpatient department. This proved to be a fruitless attempt as patients were mostly not willing to stay behind longer and study staff unable to keep track of all included patients still needing to complete the missing survey parts. In a second attempt, patients were asked to state an email address and after completing the first parts of the survey an automatically generated email was sent consisting of the two last questionnaires. Printed versions of these were still handed out as a form of double security/protection. The approach increased responses greatly.

Still, there was missing data at the end of the data collection process. As patients consented to the insight into their personal information via the openMedocs-System, phone numbers were available for study staff. After calling all patients with missing data and completing the survey parts on the phone, the data collection process was finished. Strict anonymity and data confidentiality was maintained during the entirety of the data collection process.

3. Results

As the clinical trial involved 200 participants, which were further divided into two groups of 100 individuals each, this chapter offers an in-detail description of the acquired data.

First, the demographical and injury-related data is analyzed. Focusing not only on the sample but also on differences between the two investigated outpatient departments.

Next, data from the intercorrelation analysis of VUCA factors are detailed. The bivariate analysis, using correlation of the satisfaction of the doctor-patient-consultation regarding the VUCA solutions, is discussed as well.

Last, results from the multivariate regression analysis are explored.

3.1 Demographical data, Injury-related data, and allocation

In the following chapter observations from the sample, with 200 participants, are discussed as well as specific differences between the orthopedic department for elective appointments and the primary care unit, with 100 patients each, are demonstrated.

Please see Table 1a and Table 1b for a summary.

Table 1a. Characteristics of study population – Part 1

Parameter	Total (n=200)			Primary Care (n=100)		Elective Appointments (n=100)		Difference Primary Care - Elective Appointments		
	Value	Std. dev.	Range	Value	Std. dev.	Value	Std. dev.	P-Value	95% CI	Test
Age (years)*	43	17	18-82	40	1.6	46	1.7	***.009***	[-10.75;-1.54]	*t*
Sex								***.046***		Fisher exact
Female	113 (56.5%)			49 (49%)		64 (64%)				
Male	86 (43%)			50 (50%)		36 (36%)				
Third	1 (0.5%)			1 (1%)		0 (0%)				
BMI	26	5.3	16-46	25	5.0	26	5.6	*.496*	[-1.99;0.97]	*t*
Education (years)*	13	3.5	8-40	14	3.9	12	2.3	***< .001***	[1.65;3.45]	*t*
Working status								**0.009**		Pearson's χ^2
Student	29 (14.5%)			21 (21%)		8 (8%)				
Employed	120 (60%)			62 (62%)		58 (58%)				
Out of work	12 (6%)			4 (4%)		8 (8%)				
Retired	39 (19.5%)			13 (13%)		26 (26%)				
Marital status								*.957*		Fisher exact
Single	57 (28.5%)			28 (28%)		29 (29%)				
Married/Couple	118 (59%)			59 (59%)		59 (59%)				
Divorced / separated	20 (10%)			11 (11%)		9 (9%)				
Widowed	5 (2.5%)			2 (2%)		3 (3%)				
Living								*1.000*		Fisher exact
Alone	52 (26%)			26 (26%)		26 (26%)				
Multi-person household	148 (74%)			74 (74%)		74 (74%)				
Smoking habits								*.880*		Fisher exact
No	136 (68%)			67 (67%)		69 (69%)				
Yes	64 (32%)			33 (33%)		31 (31%)				

* Values are expressed as mean ± std. dev.

Table 1b. Characteristics of study population – Part 2

Parameter	Total (n=200)			Primary Care (n=100)		Elective Appointments (n=100)		Difference Primary Care - Elective Appointments		
	Value	Std. dev.	Range	Value	Std. dev.	Value	Std. dev.	P-Value	95% CI	Test
Alcohol consumption								*.577*		Fisher exact
Never	52 (26%)			22 (22%)		30 (30%)				
1x per month	60 (30%)			29 (29%)		31 (31%)				
2-4x per month	61 (30.5%)			35 (35%)		26 (26%)				
2-3x per week	24 (12%)			12 (12%)		12 (12%)				
≥4x per week	3 (1.5%)			2 (2%)		1 (1%)				
Gross annual salary	n = 199			n=99		n=100		***.004***		Pearson's χ^2
< 11 200€	63 (31.66%)			31 (31.31%)		32 (32%)				
11 200€ - 17 400€	34 (17.09%)			9 (9.09%)		25 (25%)				
17 400€ - 22 900€	18 (9.05%)			5 (5.05%)		13 (13%)				
22 900€ - 28 100€	24 (12.06%)			16 (16.16%)		8 (8%)				
28 100€ - 33 000€	16 (8.04%)			11 (11.11%)		5 (5%)				
33 000€ - 39 000€	16 (8.04%)			11 (11.11%)		5 (5%)				
>39 000€	28 (14.07%)			16 (16.16%)		12 (12%)				
Injury condition								***< .001***		Pearson's χ^2
Non-traumatic	104 (52%)			19 (19%)		85 (85%)				
Traumatic	96 (48%)			81 (81%)		15 (15%)				
Days since injury	524	1648	0-15716	6.4	16	1041	2218	***< .001***	474.95; -594.	*t*
Injury region								***.005***		Fisher exact
Head	7 (3.5%)			7 (7%)		0 (0%)				
Neck	7 (3.5%)			4 (4%)		3 (3%)				
Upper extremity	53 (26.5%)			32 (32%)		21 (21%)				
Trunk	31 (15.5%)			10 (10%)		21 (21%)				
Lower extremity	102 (51%)			47 (47%)		55 (55%)				
Allocation								***< .001***		Pearson's χ^2
Self-assignment	90 (45%)			79 (79%)		11 (11%)				
Referral from the family doctor	41 (20.5%)			14 (14%)		27 (27%)				
Referral from the specialist	69 (34.5%)			7 (7%)		62 (62%)				

* Values are expressed as mean ± std. dev.

3.1.1 Demographical data

Patients' age in the sample ranged from 18 to 82 years with a mean of 43 years and a standard deviation of 17 (=std. 17). The average age in the primary care unit was 40 years (std. 1.6). In contrast the mean at the orthopedic department for elective appointments resulted in 46 years (std. 1.7). A two-sided *t*-test confirmed a difference between the orthopedic department for elective appointments and the primary care unit regarding patients' age with a p-value of 0.009, which was statistically significant, and a 95 % confidence interval ranging from -10.75 to -1.54 [95 % CI -10.75; -1.54]. When comparing the mean from the orthopedic department for elective appointments with the one from the primary care unit, chronically impaired patients were on average older there than those at the primary care unit with a difference in mean of 6.2 years.

Out of the 200 observations 56.5% were female, 43% male and 0.5% non-binary. At the primary care unit, patients were divided into 49% female, 50% male, and 1% non-binary. In contrast, 64% of female and 36% of male patients were questioned at the orthopedic department for elective appointments. Regarding these numbers, there were more chronically impaired female patients surveyed than ones in the primary care unit. A Fisher exact test confirmed the dependency between the surveyed departments with a statistically significant p-value of 0.046.

A mean of 26 (std. 5.3) with a range from 16 to 46 was calculated for the average BMI of the sample. The mean of 25 (std. 5.0) in the primary care unit resembled the mean of 26 (std. 5.6) in the orthopedic department for elective appointments. A two-sided *t*-test with a non-significant p-value of 0.496 [95 % CI -1.99; 0.97] confirmed the lack of difference.

The educational level was set with a mean of 13 years (std. 3.5) and a range of eight to 40 years. 13 years lay between a high school degree (=Matura) with twelve years and a bachelor's degree with 15 years. The singular value of 40 years would be seen as a statistical outlier. At the primary care unit, the mean resulted in 14 years (std. 3.9) and at the orthopedic department for elective appointments the mean was twelve years (std. 2.3). The two-sided *t*-test confirmed that there was a statistically significant difference between chronically impaired orthopedic patients and those in the primary care unit regarding education levels with a p-value smaller than 0.001

[95 % CI 1.65; 3.45]. Patients at the primary care unit were in terms of the averages higher educated with a difference in mean of 2.55 years. This statistically significant p-value may be explained through the statistical outlier of 40 years, stated by a patient at the traumatological outpatient department. The result of the two-sided t-test would therefore be a higher educational level for the group.

Regarding the working status of the sample, 14.5 % were students, 60 % were employed, 6 % were out of work and 19.5 % retired. A Pearson's chi-square test revealed a statistically significant dependency between the orthopedic department for elective appointments and the primary care unit with a p-value of 0.009. Analyzing the calculated means for the different working statuses of each group helped to understand this result. While 21 % of patients were students at the primary care unit, students made merely 8 % of the orthopedic department for elective appointments group. Employment rates were nearly identical with 62 % in the primary care unit and 58 % in the orthopedic department for elective appointments. The rate of unemployment in the primary care unit was half of the one in the orthopedic department for elective appointments with a rate of 8 %.

13 % of primary care patients were retired, which was half as many as orthopedic elective patients in retirement with 26 %.

Of the whole sample, 28.5 % were single, 59 % married or in a relationship, 10 % were divorced or separated and 2.5 % were widowed. From the primary care unit, 28 % were single, 59 % married or in a relationship, 11 % were divorced and 2 % were widowed. The numbers from the orthopedic department for elective appointments drew a similar picture with 29 % of patients single, 59 % married or with a partner, 9 % divorced or separated and 3 % widowed. The Fisher exact test for dependencies between the orthopedic and traumatological patients showed no statistically significant result with a p-value of 0.957.

Living arrangements were divided evenly within the whole sample and different groups. 26 % of patients were living alone in the sample as well as in the different outpatient departments. Same counted for people in multi-person households which resulted in 74 % of the sample and each group. The Fisher exact test in accordance showed no statistically significant dependency with a p-value of 1.000.

68% of the sample patients were non-smokers. The difference between the two groups was 1 % in the primary care unit as well as in the orthopedic department for

elective appointments. The Fisher exact test showed no statistically significant dependency with a p-value of 0.880.

There seemed to be distinct differences in alcohol consumption between the different groups. But a Fisher exact test showed no statistically significant result with a p-value of 0.577. In the sample 26 % of patients described themselves as non-alcoholic, 30 % drank once a month, 30.5 % consumed alcohol two to four times per month, 12 % two to three times a week, and 1.5 % used alcohol more than four days per week. At the primary care unit, 22 % of patients said that they never consume alcohol, 29 % only once a month, 35 % two to four times per month, 12 % consumed alcohol two to three times per week, and 2 % more than four times a week. 30 % of patients from the orthopedic department for elective appointments never consumed alcohol, 31 % drank alcohol once a month, 26 % two to four times a month, 12 % consumed alcohol two to three times a week, and 1 % more than four days a week. As one participant refused to answer the question regarding the gross annual salary, the results of the remaining 199 patients are reviewed.

From the sample 31.66 % earned less than 11 200 € a year, 17.09 % between 11 200 and 17 400 €, 9.05 % made 17 400 to 22 900 € a year, 12.06 % 22 900 to 28 100 €, 8.04 % accumulated 28 100 to 33 000 €, another 8.04 % earned 33 000 to 39 000 € a year and 14.07 % more than 39 000 € a year. Of the 99 primary care patients 31.31 % made less than 11 200 € a year, 9.09 % between 11 200 and 17 400 €, 5.05 % from 17 400 to 22 900 €, 16.16 % earned 22 900 to 28 100 € a year, 11.11 % lived with 28 100 to 33 000 €, the other 11.11 % with 33 000 to 39 000 € and 16.16 % with more than 39 000 €. In contrast in the orthopedic department for elective appointments of the 100 patients, 32 % earned less than 11 200 € a year, 25 % made 11 200 to 17 400 €, 13 % 17 400 to 22 900 €, 8 % earned 22 900 to 28 100 € a year, 5 % 28 100 to 33 000 €, another 5 % between 33 000 and 39 000 € and 12 % more than 39 000 € a year. There seemed to be similarities in income with the lowest and highest earning categories between the primary care unit and the orthopedic department for elective appointments. But more patients in the primary care unit scored a higher gross annual salary, especially between 22 900 and 39 000 € than patients in the orthopedic department for elective appointments. More of the patients with elective appointments earned a gross annual salary between 11 200 and 22 900€ than primary care patients. This seemed to indicate that patients in the primary care unit were more affluent than patients at the

orthopedic department for elective appointments. The Pearson's chi-square test affirmed a statistically significant dependency between the primary care unit and the orthopedic department for elective appointments with a p-value of 0.004.

3.1.2 Injury-related data and allocation

To obtain information about the condition of the injury, patients were questioned whether they sustained an injury traumatically or non-traumatic. Of the sample with 200 observations 52 % experienced non-traumatic impairment and 48 % a trauma. Out of the 100 primary care patients, 19 % got injured non-traumatically and 81 % traumatically. 85 % of the patients in the orthopedic department for elective appointments experienced non-traumatic impairment and the remaining 15 % a trauma. The data shows that injury-related conditions are inverse in cause regarding the different outpatient departments. More primary care patients experienced trauma while orthopedic elective patients showed a higher rate of non-traumatic impairment. Dependencies between the outpatient departments were statistically significant with a p-value of less than 0.001 for the Pearson's chi-square test. A mean of 524 days (std. 1648) with a range from zero to 15 716 days since the injury passed before a consultation happened. At the primary care unit patients waited on average 6.4 days (std. 16) after the injury before consulting a doctor. At the orthopedic department for elective appointments, a consultation happened within a mean of 1041 days (std. 2218). Primary care patients consult a doctor on average sooner than patients with an elective appointment. The *t*-test showed a statistically significant dependency between the traumatological and orthopedic outpatient departments with a p-value of less than 0.001 [95% CI -1474.95; -594.79].
Of the sample 3.5 % sustained an injury to the head, another 3.5 % to the neck, 26.05 % showed impairment on the upper extremity, 15.5 % an injury of the trunk and with 51 % more than half injured their lower extremity. At the primary care unit, 7 % of patients showed head injuries, 4 % injuries to the neck, 32 % impairment of the upper extremity, 10 % to the trunk, and a majority of 47 % injured lower extremities. At the orthopedic department for elective appointments, no head injuries were recorded, 3 % of patients sustained an injury to the neck, 21 % an injury of the upper extremity, another 21 % showed impairment of the trunk and more than half

of the patients (55 %) visited with an injury of the lower extremities. While no head injuries were recorded at the orthopedic department for elective appointments, 7 % of patients visited the primary care unit with this type of injury. While more primary care patients showed injuries of the upper extremities, 11 % more trunk injuries were treated at the orthopedic department for elective appointments. Roughly half of the treated patients from both groups visited due to impairment of the lower extremities. The Fisher exact test points to a statistically significant dependency between primary care and patients with elective appointments with a p-value of 0.005.

45 % of the sample visited the outpatient departments in self-assignment, while 20.5 % came with a referral from the family doctor and 34.5 % with a referral from a specialist. At the primary care unit 79 % consulted a doctor in self-assignment, 14 % visited with a referral from the family doctor, and 7 % with a referral from a specialist. In contrast, merely 11 % of patients in the orthopedic department for elective appointments came to the consultation self-assigned, 27 % with a referral from the family doctor, and an average of 62 % of patients with elective appointments visited with a referral from the specialist. While the majority of primary care patients consulted a doctor in self-assignment, the larger part of patients with elective appointments visited with a referral from a specialist. The Pearson's chi-square test resulted in a statistically significant dependency between the primary care unit and the orthopedic department for elective appointments with a p-value of less than 0.001.

3.2 VUCA Categories

For further details please note Table 2.

Table 2. VUCA Categories (n = 200)

Parameter	Total (n=200)			Primary Care (n=100)		Elective Appointments (n=100)		Difference Primary Care - Elective Appointments		
	Value	Std. dev.	Range	Value	Std. dev.	Value	Std. dev.	P-Value	95% CI	Test
PROMIS Scale - Pain Intensity	51	8,1	31-72	52	7,3	51	8,8	*.188*	[-0.74; 3.76]	*t*
PROMIS Bank - Physical Function	38	9,7	17-72	34	8,5	42	9,3	***< .001***	[-10.40; -5.44]	*t*
Patient Questionnaire-NRS	5,6	2,5	0-10	5,8	2,2	5,3	2,8	*0.125*	[-0.15; 1.25]	*t*
Intolerance of Ambiguity Scale	65	8,0	40-85	67	7,2	63	8,4	***.002***	[1.38; 5.74]	*t*
novelty	19	3,3	5-28	19	3,1	19	3,5	*.813*	[-1.03; 0.81]	*t*
complexity	36	6,2	17-50	38	5,6	34	6,2	***< .001***	[1.91; 5.21]	*t*
insolubility	11	3,4	3-19	11	3,0	11	3,7	*.818*	[-0.83; 1.05]	*t*
Intolerance of Uncertainty Scale	29	8,7	12-60	28	8,3	30	8,9	***.032***	[-5.05; -0.23]	*t*
Need for Cognitive Closure	55	13	27-91	52	13	58	12	***.001***	[-9.50; -2.46]	*t*
AAQ-II	18	10	7-49	17	9	20	10	***.006***	[-6.28; -1.04]	*t*

First, results from the pain scales are discussed.

A mean of 51 (std. 8.1) with a range from 31 to 72 was calculated for the PROMIS Scale – Pain Intensity for the sample with 200 observations. At the primary care unit the mean was 52 (std. 7.3) and at the orthopedic department for elective appointments 51 (std. 8.8). The two-sided t-test showed no statistically significant result with a p-value of 0.188 [95 % CI -0.74; 3.76]. The study populations' pain intensity was merely slightly higher than the standardized score of 50 (std. 10) for the general US population.

With the PROMIS Bank – Physical Function a mean of 38 (std. 9.7) and a range from 17 to 72 was calculated for the sample. The mean for patients at the primary care unit was 34 (std. 8.5) and with patients from the orthopedic department for elective appointments, the mean resulted in 42 (std. 9.3). Regarding the results from the different groups, there seemed to be a difference in physical function with patients with elective appointments being less impaired than primary care patients. A two-sided t-test confirmed the difference with a statistically significant p-value of less than 0.001 [95 % CI -10.40; -5.44].

For the numerical rating scale for the pain intensity during the participation in the survey a mean value of 5.6 (std. 2.5) was recorded. The mean value of 5,6 thereby indicates moderate levels of pain intensity with zero meaning no pain and ten the worst imaginable intensity of pain. [35] At the primary care unit pain intensity levels were with a mean of 5.8 (std. 2.2) slightly higher than the mean of 5.3 (std. 2.8) at the orthopedic department for elective appointments. Even though the mean pain intensity at the primary care unit was on average slightly higher no statistically

significant difference between the departments was recorded. The p-value was 0.125 [95% CI -0.15; 1.25] for the t-test.

The Intolerance of Ambiguity Sale was evaluated in its entirety but also divided into subscales and analyzed. The mean of the Intolerance of Ambiguity Scale was 65 (std. 8.0) with a range from 40 to 85. In the primary care unit, the mean was 67 (std. 7.2). In the orthopedic department for elective appointments, a mean of 63 (std. 8.4) was calculated. There seems to be a difference in intolerance of ambiguity between the groups with a higher intolerance level in primary care patients. A statistically significant p-value of 0.002 [95 % CI 1.38; 5.74] was calculated using a two-sided t-test. One of the subscales of the Intolerance of ambiguity scale was novelty which scored a mean of 19 (std. 8.0) and a range between five and 28 with the sample. With a mean of 19 (std. 3.1) at the primary care unit and a mean of 19 (std. 3.5) at the orthopedic department for elective appointments, no difference was found. The two-sided t-test confirmed the lack of difference with a p-value of 0.813 [95 % CI -1.03; 0.81]. The subscale complexity showed a mean of 36 (std. 6.2) and a range between 17 and 50 for the sample. A mean of 38 (std. 5.6) was calculated for patients in the primary care unit, while a mean of 34 (std. 6.2) was found with patients in the orthopedic department for elective appointments. A statistically significant difference between the two groups was confirmed by a two-sided t-test with a resulting p-value of less than 0.001 [95 % CI 1.91; 5.21]. For the subscale insolubility, a mean of 11 (std. 3.4) and a range from three to 19 was calculated. A mean of 11 (std. 3.0) was found with primary care patients as well as the same mean of 11 (std. 3.7) with orthopedic patients with elective appointments. No statistical significance was found with the two-sides t-test as the p-value was 0.818 [95 % CI -0.83; 1.05].

The Intolerance of Uncertainty scale showed a mean of 29 (std. 8.7) with a range from twelve to 60. At the primary care unit, a mean of 28 (std. 8.3) was calculated, while at the orthopedic department for elective appointments a mean of 30 (std. 8.9) was recorded. There seemed to be a difference between the groups with primary care patients showing higher levels of intolerance of uncertainty than patients in the orthopedic department for elective appointments. A two-sided t-test showed a statistically significant difference with a p-value of 0.032 [95 % CI -5.05; -0.23].

A sample mean of 55 (std. 13) with a range from 27 to 91 was calculated for the Need of Cognitive Closure scale. The mean at the primary care unit was 52 (std.

13). At the orthopedic department for elective appointments, a mean of 58 (std. 12) was recorded. The two-sided t-test showed a statistically significant difference with a p-value of 0.001 [95 % CI -9.50; -2.46].

The Acceptance and Action Questionnaire II showed a mean of 18 (std. 10) and a range between 7 and 49 for the sample. At the primary care unit, the mean was 17 (std. 9) and at the orthopedic department for elective appointments the mean scored 20 (std. 10). A statistically significant difference was shown with the two-sided t-test and a p-value of 0.006 [95 % CI -6.28; -1.04].

3.3 Intercorrelation between VUCA Factors

For further details please note Table 3.

Table 3. Intercorrelation VUCA (n = 200)

	AAQ-II	IOU	NCC	IOA
AAQ-II	1,00			
IOU	0.67*	1,00		
NCC	0.43*	0.52*	1,00	
IOA	-0.18*	-0.18*	-0.49*	1,00

* P value < 0.05

AAQ-II - Acceptance and action questionnaire II

IOU - Intolerance of uncertainty

NCC - Need for cognitiv closure

IOA - Intolerance of ambiguity

With the help of cross tables, an intercorrelation between the VUCA-specific questionnaires for the sample with 200 observations was evaluated. Volatility was examined using the Acceptance and Action Questionnaire II (=AAQ-II). Uncertainty was determined with the Intolerance of Uncertainty questionnaire (=IOU). The Need for Cognitive Closure questionnaire (=NCC) was utilized to describe complexity and the Intolerance of Ambiguity scale (=IOA) for ambiguity.

The IOU and AAQ-II questionnaires showed a moderate positive correlation of 0.67 with a p-value smaller than 0.05.

The NCC showed a moderate positive correlation with a value of 0.43 for the intercorrelation with AAQ-II, which is statistically significant with a p value smaller than 0.05. The intercorrelation analysis showed a moderate positive correlation of 0.52 for the intercorrelation between NCC and IOU, which is statistically significant with a p-value smaller than 0.05.

The IOA scale had a weak negative intercorrelation of -0.18 with AAQ-II. The same intercorrelation of -0.18 was found between IOA and IOU. Both were statistically significant with a p-value smaller than 0.05. Between the IOA and NCC, a moderate negative correlation of -0.49 was calculated. The calculation showed statistical significance with a p-value smaller than 0.05.

3.4 VUCA Solutions

For further details please note Table 4.

Table 4. VUCA Solutions (n = 200)

Parameter	Total (n=200)			Primary Care (n=100)		Elective Appointments (n=100)		Difference Primary Care - Elective Appointments		
	Value	Std. dev.	Range	Value	Std. dev.	Value	Std. dev.	P-Value	95% CI	Test
Vision	4,5	1,6	1-6	4,5	1,6	4,6	1,6	*.928*	[-0.45; 0.41]	*t*
Understanding	4,8	1,5	1-6	4,7	1,5	4,9	1,4	*.287*	[-0.63; 0.19]	*t*
Clarity	4,9	1,4	1-6	4,9	1,4	4,9	1,4	*.842*	[-0.35; 0.43]	*t*
Adaptability	4,7	1,5	1-6	4,7	1,5	4,8	1,5	*.742*	[-0.49; 0.35]	*t*
Satisfaction	8,3	2,5	0-10	8,2	2,5	8,3	2,4	*.774*	[-0.79; 0.59]	*t*

The Post Interventional Survey consisted of the fulfillment questionnaire with four questions, one for each of the four VUCA solutions, and the numerical rating scale examining patients' satisfaction with the doctor-patient consultation.

The first subscale of the fulfillment questionnaire was vision. A mean of 4.5 (std. 1.6) and a range between one and six was calculated. At the primary care unit, the mean was 4.5 (std. 1.6) and at the orthopedic department for elective appointments the mean was 4.6 (std. 1.6). A two-sided t-test showed no statistical significance with a p-value of 0.928 [95 % CI -0.45; 0.41]. For the understanding subscale, a mean of 4.8 (std. 1.5) and a range from one to six was found. A mean of 4.7 (std. 1.5) for the primary care unit and a mean of 4.9 (std. 1.4) for the orthopedic department for elective appointments were calculated. There was no statistically significant difference between the two departments with a p-value of 0.287 [95 % CI -0.63; 0.19] for the two-sided t-test. The mean for clarity for the sample was 4.8 (std. 1.4) with a range from one to six. At the primary care unit, the mean was 4.9 (std. 1.4) and at the orthopedic department for elective appointments the mean resulted in 4.9 (std. 1.4). The two-sided t-test showed no statistical significance with a p-value of 0.842 [95 % CI -0.35; 0.43]. The adaptability subscale found a mean of 4.7 (std. 1.5) and a range from one to six for the sample. A mean of 4.7 (std. 1.5) was calculated

for patients at the primary care unit and a mean of 4.8 (std. 1.5) for patients at the orthopedic department for elective appointments. No difference between the groups was found with the two-sided t-test and a p-value of 0.742 [95 % CI -0.49: 0.35].
The Satisfaction survey showed a mean of 8.3 (std. 2.5) and a range from zero to ten for the sample. At the primary care unit, the mean for patients' satisfaction was 8.2 (std. 2.5). At the orthopedic department for elective appointments, a mean of 8.3 (std. 2.4) was calculated. The two-sided t-test showed no statistically significant difference between the primary care unit and the orthopedic department for elective appointments for patients' satisfaction with a p-value of 0.774 [95 % CI -0.79; 0.59].

3.5 Intercorrelation Analysis for Satisfaction

For more detailed information please note Table 5.

Table 5: Intercorrelation Satisfaction (n = 200)

	V	U	C	A
All Patients	0.68*	0.78*	0.82*	0.78*
Primary Care	0.70*	0.82*	0.82*	0.82*
Elective Appointments	0.65*	0.74*	0.81*	0.74*

* P value < 0.05
V - Vision
U - Understanding
C - Clarity
A - Adaptability

A cross-table was calculated to analyze the intercorrelation between the individual VUCA-specific satisfaction questions and either the sample or the two different groups, the primary care unit and the orthopedic department for elective appointments.

First, results for the sample with 200 observations were examined. The following values of intercorrelation are at least moderate positively correlated and statistically significant with a p-value smaller than 0.05.

The intercorrelation of the sample with vision showed a value of 0.68. For the intercorrelation between the sample and understanding, a value of 0.78 was calculated. The intercorrelation between the sample and clarity showed a value of 0.82. An intercorrelation with a value of 0.78 was calculated for the sample and adaptability.

With patients form the primary care unit, the intercorrelation with vision showed a value of 0.70. Primary care patients correlate with understanding with a value of 0.82. The same value of 0.82 was calculated for the intercorrelation of patients in the primary care unit and clarity. The same value of 0.82 was found for the intercorrelation of the primary care unit patients and adaptability.

With patients in the orthopedic department for elective appointments, an intercorrelation of 0.65 was found for vision. With understanding an intercorrelation with a value of 0.74 was calculated. The intercorrelation between orthopedic elective patients and clarity was 0.81. An intercorrelation of 0.74 was calculated for the relation between patients in the orthopedic department for elective appointments and adaptability.

3.6 Multivariable Linear Regression Model on Satisfaction and Fulfillment

For further information please note Table 6a and Table 6b.

Table 6a. Multivariate linear regression model on satisfaction and VUCA solutions - Elective Appointments

Satisfaction	Coef.	Std. Error	t-score	p-value	95% Conf. Interval		R-squared
Vision	0,09	0,16	0,57	*.572*	-0,22	0,40	
Understanding	0,31	0,18	1,7	*.090*	-0,05	0,68	
Clarity	0,95	0,21	4,5	***< .001***	0,53	1,4	
Adaptability	0,11	0,21	0,54	*.593*	-0,31	0,53	
_cons	1,2	0,52	2,3	**.024**	0,16	2,2	.682

Table 6b. Multivariate linear regression model on satisfaction and VUCA solutions - Primary Care

Satisfaction	Coef.	Std. Error	t-score	p-value	95% Conf. Interval		R-squared
Vision	-0,13	0,18	-0,72	*.474*	-0,49	0,23	
Understanding	0,65	0,23	2,8	***.007***	0,19	1,1	
Clarity	0,65	0,20	3,3	***.002***	0,26	1,0	
Adaptability	0,37	0,25	1,5	*.151*	-0,14	0,87	
_cons	0,83	0,48	1,7	*.088*	-0,13	1,8	0,744

Multivariable linear regression analysis was conducted to evaluate whether the fulfillment of VUCA solutions during the doctor-patient consultation may lead to increased patient satisfaction. Regression models were calculated separately for the orthopedic department for elective appointments as well as the primary care unit.

At the orthopedic department for elective appointments, the multivariable linear regression analysis showed a coefficient of 0.09 with a standard error (=std. error) of 0.16 and a t-score of 0.57. The p-value of 0.572 [95 % CI -0.22; 0.40] indicated that this coefficient is not significant. Thus, interpretation is not recommended.

The analysis of understanding revealed a coefficient of 0.31 (std. error 0.18) and a t-score of 1.7. With a p-value of 0.090 [95 % CI -0.05; 0.68] no statistical significance was found.

The regression analysis for clarity showed a coefficient of 0.95 (std. error 0.21) and a t-score of 4.5. This coefficient is significant with a p-value of less than 0.001 [95 % CI 0.53; 1.4]. Therefore, it can be stated that clarity increases patient's satisfaction at the orthopedic department for elective appointments.

For adaptability, a coefficient of 0.11 (std. error 0.21) and a t-score of 0.54 was calculated. The p-value of 0.593 [95% CI -0.31; 0.53] showed no statistical significance.

The consensual analysis, hinting at the shift on the y-axis, showed a coefficient of 1.2 (std. error 0.52) and a t-score of 2.3. The coefficient was significant with a p-value of 0.024 [95 % CI 0.16; 2.2].
A value of 0.682 was calculated for R-squared. R-squared indicates how close the data cloud reaches the calculated linear regression. In this case it indicated a good model fit.

The second multivariable linear regression model was established for the primary care unit.
The coefficient for vision was calculated with -0.13 (std. error 0.18) and a t-score of -0.72. The p-value of 0.474 [95 % CI -0.49; 0.23] showed no statistical significance.
The analysis revealed a coefficient of 0.65 (std. error 0.23) and a t-score of 2.8 for understanding. The p-value of 0.007 [95 % CI 0.19; 1.1] was statistically significant. Thus, understanding increases the overall patient satisfaction with the doctor-patient consultation at the primary care unit.
For clarity, a coefficient of 0.65 (std. error 0.20) and a t-score of 3.3 was calculated. The multivariable linear regression analysis stated a statistically significant coefficient with a p-value of 0.002 [95 % CI 0.26; 1.0]. Clarity increases patients' satisfaction with the doctor-patient consultation at the primary care unit.
The coefficient for adaptability was 0.37 (std. error 0.25) and a t-score of 1.5. The p-value of 0.151 [95 % CI -0.14; 0.87] showed no statistical significance.
The consensual analysis resulted in a coefficient of 0.83 (std. error 0.48) and a t-score of 1.7. The p-value of 0.088 [95 % CI -0.13; 1.8] showed no statistical significance.
R-squared was calculated with 0.744. This indicated a good model fit.

4. Discussion

The following chapter aims to answer the stated research questions, offers a critical reflection on the research topic, literature, utilized methods to answer the questions, and discusses the limitations of the survey.

4.1 Do orthopedic patients live in a VUCA-World?

Please note Table 2.

The study aims to establish whether patients struggle with the VUCA factors of volatility, complexity, uncertainty, and ambiguity with the help of different standardized psycho-social questionnaires.

The AAQ-II evaluates people's psychological inflexibility. As volatility is characteristic of changing emotions and environments an evaluation of the study population with the AAQ-II as an indicator of psychological stress is validated. Bond et al. state that values ranging between 24 and 28 correlate with higher measures of psychological distress, which are clinically relevant, due to psychological inflexibility. [21] As values between 24 and 28 are clinically relevant, they are seen as indicators of the existence of volatility within the study population. The calculated mean for the AAQ-II for the sample is 18 (std. dev. 10), which was also seen in the healthy study populations evaluated by Bond et al. Therefore orthopedic patients show low levels of psychological distress and do not experience increased levels of volatility. [21]

To evaluate whether the study population suffers from the VUCA factor uncertainty the IUS-12 was utilized. Wilson et al. postulate a cut-off score of 28 and above with the IUS-12 for the diagnosis of GAD. [24] A mean score above 28 for the sample is seen as equal to the existence of intolerance of uncertainty and a confirmation of the existence of the VUCA factor uncertainty in the surveyed population. The sample showed a score of 29 (std. dev. 8.7) for the IUS-12, which confirms the struggle of the sampled orthopedic patients with uncertainty.

The 16-NCC scale is selected for the VUCA factor complexity. Following Kruglanski et al. a scale was developed for the interpretation of the 16-NCC published by Schlink et al. Scores between 16 and 32 are interpreted as a low need for cognitive closure and no occurrence of the VUCA factor complexity. Scores ranging from 80

to 96 indicate high levels of need for cognitive closure and confirm the struggle of orthopedic patients with complexity. [28, 29] The sample shows a mean score of 55 (std. 13) for the 16-NCC. Because the score is in the middle of the scoring scale, it can be said that orthopedic patients show medium levels of need for cognitive closure. The VUCA-specific psychosocial factor complexity cannot be confirmed with this study. The orthopedic sample patients do not suffer from the VUCA factor complexity.

Ambiguity is examined using the IOA scale. Typical scores range from 44 to 48, with higher scores indicating lower levels of intolerance of ambiguity. People with higher scores struggle more profoundly with change than those with lower scores. Therefore, higher scores prove the occurrence of the VUCA problem ambiguity in the orthopedic sample. [32] The mean score of 65 (std. dev. 8.0) for the sample lies above 48. Orthopedic patients show lower levels of intolerance of ambiguity and struggle with the VUCA-specific psychosocial factor ambiguity. The three situational aspects of novelty, complexity, and insolubility are evaluated as well. The mean score for novelty is with 19 (std. dev. 3.3) higher than the score of 15.4 (std dev 3.7) published by Sobal et al. Compared to a score of 28.7 (std. dev. 5.9) by Sobal et al. the mean score of 36 (std. dev. 6.2) for complexity is elevated. Similarly, the mean score of 11 (std. dev. 3.4) for insolubility is higher than the score of 8.5 (std. dev. 2.7) published by Sobal et al. [36] All three situational scores are elevated, indicating that orthopedic patients struggle with subjectively new, complex and insoluble situations. The score for complexity shows a further deviation from the published reference than the other situational scores indicating a higher degree of struggle with complex situations.

The orthopedic sample, therefore, struggles with two out of four VUCA factors, namely uncertainty, and ambiguity. Since the occurrence of two VUCA factors can be acknowledged for the survey, the general presents of VUCA-specific psychosocial factors in patients can be confirmed. Orthopedic patients do experience VUCA-related psychosocial problems, namely uncertainty, and ambiguity.

4.2 Do differences in patients from the orthopedic outpatient department and the primary care unit occur?

Please see Table 1a, Table 1b, and Table 2.

The second research question focuses on the differences between patients in the orthopedic department for elective appointments and primary care patients.

The statistics show a statistically significant difference in age between the orthopedic department for elective appointments and the primary care unit with a p-value of 0.009 [95% CI -10.75; -1.54] for the t-test. On average patients with elective appointments were with 46 years (std. 1.7) six years older than primary care patients with a mean of 40 years (std. 1.6). Chronic impairment and pain patients with elective appointments for an orthopedic subspecialty are older than patients at the primary care unit. As primary care patients often experience traumatic events and younger people tend to be more often engaged in active and precarious activities, the difference can be explained. It must be noted that elderly patients visiting the primary care unit with a fall were often excluded from the survey as they did not feel comfortable enough using the tablets or suffered from a degenerative neurologic disease, such as Alzheimer's dementia.

The difference in sex is also recorded with a statistically significant p-value of 0.046 for the Fisher exact test. For the sample, more women were questioned with 56.5% female, 43 % male and 0,5 % non-binary patients. With 64 % female participants 15 % more patients with elective appointments were women than in the primary care unit. In general, females tend to grow older than males and therefore represent more of the chronic patient population in this survey. Another explanation may be that females were more likely to participate in the survey than males.

A statistically significant difference in educational levels can be shown with a p-value smaller than 0.001 [95% CI 1.65; 3.45] for Pearson's chi-square test. Primary care patients are higher educated by two years than patients with elective appointments. As younger patients seem to visit the primary care unit more frequently and educational levels are on the rise, a higher educational level for primary care patients is the result.

A statistically significant difference is seen regarding the working status with a p-value of 0.009 for Pearson's chi-square test. 13 % more students are recorded for the primary care unit and employment rates are higher by 4 %. The primary care patients are on average younger than patients with elective appointments. Rates for

people out of work or in retirement are twice as high in the orthopedic department for elective appointments than in the primary care unit, which mirrors the on average older patient clientele of the outpatient department and the chronic impairment.

The gross annual salary shows a statistically significant difference with a p-value of 0.004 for Pearson's chi-square test. Primary care patients are more affluent than patients with elective appointments, especially at income rated from 22.900 € to 39.000 €, where double as many patients earn these salaries. In the lower income categories, 16 % more patients with elective appointments earn less than 17.400 € a year and 8 % less than 22.900 € than the primary care patients. There should be a correlation between the advanced age of patients at the orthopedic department for elective appointments, as well as the lower educational level and the higher unemployment rate.

With the differentiation between primary care patients and patients with elective appointments, a distinction between injury conditions is likely to occur. Statistics confirm such a distinction with a statistically significant p-value smaller than 0.001 for Pearson's chi-square test. With 85 % non-traumatic injuries are 66 % higher for patients with elective appointments. A higher range of trauma-related injuries can be seen in the primary care unit specializing in acute trauma patients.

Since patients with elective appointments often suffer from chronic injuries or illnesses a statistically significant difference with a p-value smaller than 0.001 [95 % CI -1474.95; -594.79] for the Fisher exact test for the injury onset at the orthopedic department for elective appointments is plausible.

A statistically significant difference in injury region is recorded, with a p-value of 0.005 for the Fisher exact test. Since no specialist offers treatment for head injuries at the orthopedic department for elective appointments no head injuries are recorded, while 7 % of questioned primary care patients visited with a head injury. A higher rate of upper extremity injuries is seen in the primary care unit, while higher rates of trunk and lower extremity injuries occur in the orthopedic department for elective appointments.

While 79 % of primary care patients visit with a self-assignment, most patients with elective appointments come with a referral from a specialist. This is logical since primary care units treat acute trauma patients while the second surveyed department is focusing on elective appointments. The difference is statistically significant with a p-value smaller than 0.001 for the Pearson chi-square test.

A statistically significant difference for the sampled is seen for the PROMIS Bank v2.0 – Physical Function with a p-Value smaller than 0.001 [95 % CI -10.40; -5.44]. As the PROMIS Bank v2.0 - Physical Function is standardized for the general US population with a score of 50 (std. 10) interpretation is conducted accordingly. With a mean of 51 (std. 8.1) the physical function of the sample is in general better than the general US population. In comparison to the orthopedic department for elective appointments, with a mean of 51 (std. 8.8), primary care patients show a higher degree of physical function with a mean of 52 (std. 7.3). Age can be seen as part of the explanation since primary care patients were on average younger.

The sample shows a mean of 65 (std. 8.0) for the IOA, which is higher than the average score ranging from 44 to 48, postulated by Budner and utilized by the Ohio Child Welfare Training Program. [32] Orthopedic patients suffer from higher levels of intolerance of ambiguity. The VUCA problem ambiguity can therefore be found within orthopedic patients. A statistically significant difference can be shown for the two departments with a p-value of 0.002 [95 % CI 1.38; 5.74]. Patients at the primary care unity experience statistically significant higher levels of intolerance of ambiguity with a mean score of 67 (std. 7.2) than patients at the orthopedic department for elective appointments with a mean score of 63 (std. 8.4). Scores for the three situational aspects of threat novelty, complexity and insolubility, are higher than the ones recorded by Sobal et al. [36] The complexity factor shows a statistically significant difference with a p-value smaller than 0.001 [1.91; 5.21]. Patients at the primary care unit suffer especially from complex situations with many impressions and information needed to be considered. Since primary care patients are mostly faced with relatively new types of injuries higher levels of intolerance of ambiguity in the complex situation of a hospital setting are comprehensible. Sobal et al. describe intolerance of ambiguity as a malleable trait, which is changeable under the social influence, rather than a static personality trait. Therefore, higher levels of intolerance of ambiguity in the sample can be interpreted as situational, especially for the hospital setting, rather than ubiquitous for the sample at all times. [36]

The IOU Scale shows a statistically significant difference between the orthopedic department for elective appointments and the primary care unit with a p-value of 0.032 [95 % CI -5.05; -0.23]. As mentioned above a score of 28 and above is confirmatory for GAD and thereby the existence of the VUCA problem uncertainty in the sample. In contrast to a score of 28 (std. dev. 8.3) at the primary care unit,

patients in the orthopedic department for elective appointments show with a score of 30 (std. 8.9) higher levels of intolerance of uncertainty. While the sample score shows, patients from both departments struggle with intolerance of uncertainty, patients in the orthopedic outpatient department experience increased levels of uncertainty by two statistically significant scoring points. Whether the VUCA solution understanding helps to overcome these forms of uncertainty is described below. [24]
As mentioned above, the questioned orthopedic patients do not suffer from the VUCA problem complexity. Nevertheless, differences between the orthopedic department for elective appointments and the primary care unit can be shown. A p-value of 0.001 [95 % CI -9.50; -2.46] is statistically significant for differences between the departments regarding the 16-NCC scale evaluating complexity. With a mean score of 58 (std. 12) patients at the orthopedic department for elective appointments show higher levels of need for cognitive closure than patients at the primary care unit with a mean score of 52 (std. 13). Regarding the calculated scale for the interpretation of the 16-NCC, both scores show no elevated levels of need for cognitive closure. But the statistically significant difference indicates that patients at the orthopedic department for elective appointments do statistically struggle more with the need for cognitive closure and therefore the VUCA factor complexity.
The AAQ-II questionnaire highlights a statistically significant difference with a p-value of 0.006 [95 % CI -6.28; -1.04] between the primary care unit and the orthopedic department for elective appointments. Patients at the primary care unit experience lower levels of psychological distress. Both mean values are below the cut-off point for clinically relevant distress. Chronic patients in this survey live statistically longer with their impairment, which might explain why levels of emotional distress are tendentially higher than those of primary care patients. [21].

4.3 Do the VUCA-factors volatility, uncertainty, complexity, and ambiguity show an intercorrelation?

Please note Table 3 for the next section.
The third research question evaluates a possible intercorrelation between the VUCA factors volatility, uncertainty, complexity, and ambiguity. Each VUCA factor is thereby analyzed singularly with a specific questionnaire.

A statistically significant moderate positive correlation with a value of 0.67 is found between the AAQ-II, which analyzes the volatility of a patient, and the IOU Questionnaire, which is used to evaluate uncertainty. The intercorrelation shows that the higher the volatility of a situation the more uncertainty is experienced. Patients who experience an increased amount of volatility on a psychosocial level during a visit to the orthopedic department show higher levels of psychosocial uncertainty as well.

The moderate positive correlation between the AAQ-II and the 16-NCC is determined with a statistically significant value of 0.43. Increased volatility leads to an increment of complexity. A rapidly changing situation is correlating with the complexity and difficulty of the moment. If patients experience a doctor's appointment as an increasingly volatile situation their psychosocial complexity rises accordingly.

A statistically significant weak negative correlation of 0.18 is calculated for the intercorrelation of AAQ-II and IOA. This indicates that decreasing volatility is accompanied by higher levels of ambiguity. If patients experience sinking levels of volatility during the doctor-patient consultation, the amount of situational ambiguity is increasing.

The correlation between IOU and 16-NCC is moderate with a statistically significant value of 0.52. The higher the uncertainty of a patient visiting the orthopedic department, as the more complex the patient will experience the situation.

The negative weak intercorrelation of 0.18 for IOU and IOA is statistically significant. The less psychosocial uncertainty the consultation evokes, the more ambiguous the patients' experiences get.

A moderate negative correlation of 0.49 is calculated for NCC and IOA, which is statistically significant. With decreasing complexity, a doctor-patient consultation evolves into an equally more ambiguous situation.

To summarize, in this survey all VUCA factors intercorrelate. Most VUCA intercorrelations show a positive correlation, meaning an increment of one VUCA factor leads to the increase of another. Some VUCA factors negatively influence each other, while one factor decreases the other increases. Attempts to lessen patients' experiences of the psychosocial VUCA factors decrease volatile, uncertain, complex, and ambiguous doctor-patient consultations. If the VUCA solutions vision,

understanding, clarity and adaptability lead to increasing patients' satisfaction, is the aim of the next research question. [34] [11]

4.4 Are patients more satisfied after a doctor-patient consultation, if specific selected VUCA-solutions are discussed?

Please see Table 4 for further details.

The aim is to establish whether patients' satisfaction with the doctor-patient-consultation correlates with the VUCA solutions vision, understanding, clarity and adaptability.

Statistically significant positive correlations can be found for each of the VUCA solutions and patients' satisfaction.

Vision correlates with the satisfaction of the sample with a moderate positive correlation of 0.68. The more vision a patient is offered during the doctor-patient consultation, the higher levels of patient satisfaction can be obtained.

Each of the other three VUCA solutions shows a statistically significant strong intercorrelation with patients' satisfaction, with 0.78 for understanding, clarity 0.82 and adaptability 0.78. If the doctor-patient consultation increases understanding/clarity/adaptability, patients' satisfaction with the consultation increases accordingly. An increase in the usage of the VUCA solutional approaches leads to a corresponding increase in satisfaction.

Differences between the primary care unit and the orthopedic department for elective appointments can be seen as well. In accordance with the samples, both departments show a statistically significant moderate correlation between vision and patient satisfaction, but the value of correlation is with 0.70 for the primary care unit higher than the value of 0.65 for the orthopedic department for elective appointments. Statistically significant strong correlations can be found for the VUCA solutions understanding, clarity and adaptability. The correlations for the primary care unit show higher values than the ones from the orthopedic department for elective appointments. With increasing utilization of VUCA solutions in the primary care unit levels of patient satisfaction can further increase than those at the orthopedic department for elective appointments.

In general, the more VUCA solutions are addressed during the doctor-patient consultation, the higher patient satisfaction will be. Differences can be seen between

the primary care unit and the orthopedic department for elective appointments. The primary care unit shows higher values of correlation for all VUCA solutions than the orthopedic department for elective appointments. Therefore, the primary care unit may achieve higher values of patients' satisfaction by increasing the use of VUCA solutions.

Since the correlations for Vision are both moderate and the correlations for understanding, clarity and adaptability are strong for both departments, differences in overall satisfaction will be small or lacking. [34] [11]

4.5 Can patients' satisfaction with the doctor-patient consultation be explained by applying the VUCA solutions?

Please note Table 5, Table 6a, and Table 6b for the next section.

The last research question aimed to establish how patients' satisfaction with the doctor-patient consultation can be explained individually for the primary care unit and the orthopedic department for elective appointments using the VUCA solutions. Multivariate linear regression models on satisfaction and VUCA solutions are calculated individually for the two different departments. With the help of multivariate linear regression analysis, the main VUCA solutions which increase satisfaction specifically for the individual department can be identified.

The multivariate linear regression model for the orthopedic department for elective appointments shows a statistically significant p-value smaller than 0.001 [95 % CI 0.53 – 1.4] for clarity. To achieve patient satisfaction at the orthopedic department for elective appointments patients especially need clarity on their diagnosis and treatment options during the consultation. The R-squared is 0.68. This indicates that 68 % of patient satisfaction with the doctor-patient consultation at the orthopedic department for elective appointments can be explained by the research model. Physicians need to focus on offering clarity to their patients to increase overall patient satisfaction with the consultation.

For the primary care unit, two statistically significant p-values are calculated. With a statistically significant p-value of 0.007 [95 % CI 0.19 – 1.1] primary care patients need understanding to achieve satisfaction from the doctor-patient-consultation. For clarity, a p-value of 0.002 [95 % CI 0.26 – 1.0] is calculated. The results show that patients visiting the primary care unit need clarity as well as understanding to feel

satisfied with the consultation. The R-squared is 0.74. 74 % of patients' satisfaction in the primary care unit can be explained by offering the patients understanding and clarity about the diagnosis and treatment options.
To summarize, patients at the orthopedic department for elective appointments need clarity to achieve satisfaction from the doctor-patient-consultation. 68 % of the satisfaction at the department can be explained accordingly. In contrast patients in the primary care unit need understanding and clarity for a satisfying doctor-patient-consultation. With this model, 74 % of the satisfaction at the primary care unit can be explained. [34]

4.6 Summary

As the survey established orthopedic patients do suffer from VUCA factors. This assumption is made because the first part of the survey shows that orthopedic patients may not suffer from volatility and complexity, but uncertainty and ambiguity levels are increased. As patients partially suffer from two out of the four VUCA factors, it is legitimate to state that VUCA-specific psychosocial factors occur in patients.
The VUCA factors influence each other. The increment of one factor leads, in most cases to an increase in the correlating VUCA factor.
Patients' satisfaction correlates with all four VUCA solutions positively. An increased focus on offering VUCA solutions to the patients during the doctor-patient-consultation leads to higher levels of patient satisfaction.
With the help of the VUCA solutions patients' satisfaction with the doctor-patient consultation can be increased, and cognitive closure offered. Orthopedic patients especially need understanding and clarity during the consultation. Differences between the two survey departments can be shown. Patients at the orthopedic department for elective appointments experience higher rates of physical impairment. Volatility, uncertainty, and complexity levels are higher for this department. In contrast, the intolerance of ambiguity level is higher in the primary care unit. Therefore, patients in the primary care unit seem more threatened by the situation than patients in the orthopedic department for elective appointments. What needs to be considered is that primary care patients have in general less time to process their injury and accompanying impairment than patients with chronic

impairment. Interestingly, patients at the primary care unit especially need the VUCA solutions understanding and clarity for a satisfying doctor-patient consultation, even though they suffer from ambiguity as well as uncertainty and not complexity. It seems plausible that patients suffering from a recent injury need more understanding about their impairment than chronic patients, who already know more about their injury.

4.7 Limitations

Since the survey was conducted using mainly tablets for questioning, especially older people often did not feel confident enough to participate, even though offers were made to work through the questioning process together. The survey, therefore, represents mainly younger participants or older ones with a broader knowledge of new technologies. Since the survey was conducted for adults aged 18 and above, no assertions can be made regarding children and adolescents. Further research in this field needs to be done to establish whether VUCA-related psychosocial factors occur with this age group. As fluidity in German was required to participate, only patients with a higher education in German were questioned. Presumptions can be made about the validity of the study results for all orthopedic patients, but further investigation will be needed to validate this claim. By using standardized psychologic questionnaires, the questioning process for each patient leads to increased questioning times between 15 to 20 minutes, depending on the patient's answering speed. Patients experiencing higher levels of pain, especially at the primary care unit, therefore, more often declined participation. Due to precision, a reduction of questionnaire parts was declined, while a reduction might have led to higher response rates for the survey.

There are no standardized questionnaires explicitly surveying peoples' psychosocial VUCA factors. For the survey standardized psychosocial questionnaires were selected to evaluate each VUCA factor, considering which would reflect each VUCA factor best. There may be other standardized questionnaires with a better representation of VUCA-specific psychosocial factors. Further evaluation will be needed for clarification.

Participants were only questioned in a hospital setting, which is in general a volatile, uncertain, complex, and ambiguous surrounding. It is therefore not possible to

establish, whether the participating orthopedic patients show higher levels of VUCA-related psychosocial factors in general or merely in a specifically VUCA prone surrounding. Further evaluation will be needed to analyze the high VUCA-related impact on hospital settings and the change of VUCA-related psychosocial levels at less threatening and especially familiar surroundings, assuming VUCA-related psychosocial factors are not personality traits but rather malleable traits responding to changeable situations and social influence.

5. Conclusion

Orthopedic and traumatological patients experience VUCA-specific psychosocial factors. While all four VUCA factors were determined, the sample only shows elevated levels of uncertainty and ambiguity. Uncertainty is more prominent with patients visiting the orthopedic department for elective appointments, while primary care patients struggle with ambiguity. Statistically significant differences between the departments can be shown with higher mean VUCA factor scores for uncertainty, complexity, and ambiguity for the orthopedic department for elective appointments. On average patients from this department struggle more profoundly with the VUCA factors.

The different VUCA factors intercorrelate with each other, leading to mostly increased values, through positive correlation, of one factor through the increment of another. Therefore, addressing one VUCA factor leads to decreasing values of other VUCA factors.

The VUCA solution, vision, understanding, clarity, and adaptability, positively correlate with patients' satisfaction with the doctor-patient consultation. Including the VUCA solutions into the consultation leads to increasing satisfaction rates and an improvement of the doctor-patient relationship by making the patients feel heard and understood.

Patients at the orthopedic department for elective appointments need especially clarity for a satisfying doctor-patient consultation. 68 % of the satisfaction in this department can be explained by the established model. Primary care patients require understanding and clarity for a satisfactory consultation. 74 % of the satisfaction rates are determined with the model. Patients profit from the inter-consultation approach of the VUCA solutions, as cognitive closure and increased levels of satisfaction are offered.

Orthopedic patients do not struggle with the same VUCA factors as the answering VUCA solutions. Attentiveness to patients' struggle with the VUCA factors is therefore recommended, while bearing in mind that orthopedic patients show higher levels of uncertainty and ambiguity, and to address all VUCA solutions during the consultation, with a special focus on understanding and clarity.

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Appendix

The questionnaires are listed below.

Screening (Inclusion / Exclusion Criteria)

Bitte füllen Sie die unten stehenden Fragen aus!

Danke!

1) Datum des Arzt-Patientengesprächs _____

Einschlusskriterien (must be YES)

2) Alter ≥ 18 Jahre
◯ Yes
◯ No

3) Erstvorstellung an der OT-Ambulanz
◯ Yes
◯ No

4) Deutsch in Wort und Schrift
◯ Yes
◯ No

5) Probanden willigen schriftlich in die Studie ein
◯ Yes
◯ No

Auschlusskriterien (must be NO)

6) Eingeschränkte Einwilligungsfähigkeit
◯ Yes
◯ No

7) Biopsychosoziale Interferenz mit anderen Studien
◯ Yes
◯ No

8) Polytrauma
◯ Yes
◯ No

Ende des Screening-Prozesses

9) Patient ist für Studie geeignet
◯ Yes
◯ No

Enrollment

Please complete the survey below.

Thank you!

Demographische Daten	
Würden Sie gerne die Follow-up Fragen nach dem Arztkontakt per Email beantworten?	◯ Yes ◯ No (aktiviert automatischen E-Mail versandt)
bevorzugte Email-Adresse (optional)	_____
Geburtsdatum	_____
Geschlecht	◯ weiblich ◯ männlich ◯ anderes
Größe (cm)	_____
Gewicht (kg)	_____
BMI	_____
Bildungsstand (in Jahren)	_____ (Pflichtschule (8), Lehre/Berufsschule (10-12), Matura (12), Bachelor (15), Master (17), Doktorat (20))
Berufsstatus	◯ SchülerIn/StudentIn ◯ Arbeitend (Angestellt, Arbeiter, Selbstständig) ◯ Arbeitslos/nicht arbeitsfähig ◯ PensionistIn
laufendes Frührenteverfahren/ Arbeitsunfähigkeitsbescheinigung	◯ Yes ◯ No
Familienstatus	◯ Single ◯ Verheiratet/Partnerschaft ◯ Geschieden/Getrennt ◯ Verwitwet
Wohnsituation	◯ Alleine ◯ Mehrpersonenhaushalt
Rauchgewohnheiten	◯ Yes ◯ No

Alkoholkonsum	◯ Nie ◯ 1x pro Monat ◯ 2-4x pro Monat ◯ 2-3x pro Woche ◯ 4x oder öfter pro Woche
Jahresbruttogehalt	◯ bis 11.200€ ◯ bis 17.400€ ◯ bis 22.900€ ◯ bis 28.100€ ◯ bis 33.000€ ◯ bis 39.000€ ◯ ab 39.000€

Verletzungsspezifische Daten

Untersuchungsdatum	_____
Initiale Vorstellung	◯ Notfallsambulanz ◯ Orthopädische Spezialambulanz
Verletzungshergang	◯ nicht traumatisch ◯ traumatisch
Zeitpunkt der Verletzung/Schmerzen	_____
Körperregion	◯ Kopf ◯ Hals ◯ Obere Extremität ◯ Stamm ◯ Untere Extremität
Zuweisung durch?	◯ Selbstzuweisung ◯ Zuweisung vom Hausarzt ◯ Zuweisung vom Facharzt

PAINQU6

In the past 7 days
How intense was your pain at its worst?

- ◯ Had no pain
- ◯ Mild
- ◯ Moderate
- ◯ Severe
- ◯ Very severe

PAINQU8

In the past 7 days
How intense was your average pain?

- ◯ Had no pain
- ◯ Mild
- ◯ Moderate
- ◯ Severe
- ◯ Very severe

PAINQU21

What is your level of pain right now?

- ◯ No pain
- ◯ Mild
- ◯ Moderate
- ◯ Severe
- ◯ Very severe

Wie stark war das Höchstmaß an Schmerzen in den letzten Tagen?	◯ 10 Stärkster vorstellbarer Schmerz ◯ 9 ◯ 8 ◯ 7 ◯ 6 ◯ 5 ◯ 4 ◯ 3 ◯ 2 ◯ 1 ◯ 0 Kein Schmerz

Intolerance of Ambiguity Scale

Please complete the survey below.

Thank you!

Bitte beantworten Sie in welchem Ausmaß Sie mit den folgenden Aussagen widerbesprechen bzw. übereinstimmen:

		lehne voll und ganz ab						stimme voll und ganz zu
699)	1. Ein Experte, der nicht zu einer eindeutigen Antwort gelangt, versteht vermutlich nicht allzuviel von der Sache.	○	○	○	○	○	○	○
700)	2. Es macht mehr Spaß, ein kompliziertes Problem anzugehen, als ein einfaches Problem zu lösen.	○	○	○	○	○	○	○
701)	3. Ich würde gern eine Zeit lang im Ausland leben	○	○	○	○	○	○	○
702)	4. Wer sein Leben einem Schema unterordnet, lässt sich viel Lebensfreude entgehen	○	○	○	○	○	○	○
703)	5. Oft sind die interessantesten und anregendsten Menschen die, denen es nichts ausmacht, anders als die meisten Leute zu sein.	○	○	○	○	○	○	○
704)	6. Ein guter Beruf ist ein Beruf, in dem immer klar ist, was zu tun ist und wie es zu tun ist.	○	○	○	○	○	○	○
705)	7. Lehrer, die nicht ganz fest umrissene Aufgaben stellen, geben einem die Chance Initiative und Originalität zu zeigen.	○	○	○	○	○	○	○
706)	8. So etwas wie unlösbare Probleme gibt es in Wirklichkeit nicht.	○	○	○	○	○	○	○
707)	9. Wer auf einem einfachen Ja oder Nein besteht, hat nicht erkannt, wie kompliziert die Dinge in Wirklichkeit sind.	○	○	○	○	○	○	○
708)								

10. Das Gewohnte ist immer dem vorzuziehen, mit dem man nicht vertraut ist.	○	○	○	○	○	○	○
709) 11. Viele unserer wichtigsten Entscheidungen werden mit unzureichenden Informationen getroffen.	○	○	○	○	○	○	○
710) 12. Ich mag Einladungen lieber, wo ich die meisten Leute kenne, als solche, bei denen mir die meisten Leute fremd sind.	○	○	○	○	○	○	○
711) 13. Ein guter Lehrer hat die Eigenschaft, einem zum Nachdenken über die eigenen Anschauungen anzuregen.	○	○	○	○	○	○	○
712) 14. Auf lange Sicht kann man mehr erreichen, wenn man kleine und einfache, als wenn man große und komplizierte Probleme angeht.	○	○	○	○	○	○	○
713) 15. Je eher alle die gleichen Werte und Ideale annehmen, desto besser.	○	○	○	○	○	○	○
714) 16. Wer ein ruhiges, geregeltes Leben führt, in dem wenig Überraschungen oder unerwartete Ereignisse auftreten, kann wirklich dankbar sein.	○	○	○	○	○	○	○

Intolerance of Uncertainty Scale

Please complete the survey below.

Thank you!

Untenstehend finden Sie eine Reihe von Aussagen, die beschreiben, wie man auf Unsicherheiten im Leben reagieren kann. Bitte kreuzen Sie bei jeder Aussage die Zahl an, die am besten auf Sie zutrifft.

		gar nicht zutreffend	ein bisschen zutreffend	ziemlich zutreffend	sehr zutreffend	völlig zutreffend
715)	1. Meine Unsicherheit hält mich davon ab, eine klare Position einzunehmen	○	○	○	○	○
716)	2. Es frustriert mich, wenn ich nicht alle Informationen habe, die ich brauche	○	○	○	○	○
717)	3. Meine Unsicherheit macht das Leben unerträglich	○	○	○	○	○
718)	4. Man sollte immer vorausschauen, um Überraschungen zu vermeiden	○	○	○	○	○
719)	5. Wenn es Zeit ist zu handeln, lähmt mich meine Unsicherheit	○	○	○	○	○
720)	6. Ein kleines unvorhergesehenes Ereignis kann alles verderben, selbst bei bester Planung	○	○	○	○	○
721)	7. Wenn ich unsicher bin, kann ich nicht gut funktionieren	○	○	○	○	○
722)	8. Ich möchte immer wissen, was die Zukunft für mich bereit hält	○	○	○	○	○
723)	9. Im Gegensatz zu mir scheinen andere immer zu wissen, wo ihr Leben hinführt	○	○	○	○	○
724)	10. Ich hasse es, überrascht zu werden	○	○	○	○	○
725)	11. Unsicher zu sein bedeutet, dass es mir an Selbstvertrauen fehlt	○	○	○	○	○
726)	12. Ich sollte in der Lage sein, alles im Voraus zu organisieren	○	○	○	○	○

Decisional Conflict Scale

Please complete the survey below.

Thank you!

Lesen Sie die folgenden Aussagen aufmerksam durch. Beurteilen Sie, wie sehr diese Aussagen in Bezug auf Ihre Behandlungsentscheidung zutreffend sind.

		Trifft überhaupt nicht zu	Trifft eher nicht zu	Trifft teilweise zu	Trifft eher zu	Trifft vollständig zu
727)	1. Ich weiß, welche Wahlmöglichkeiten ich habe.	○	○	○	○	○
728)	2. Ich kenne die Vorteile jeder Wahlmöglichkeit.	○	○	○	○	○
729)	3. Ich kenne die Risiken und Nebenwirkungen jeder Wahlmöglichkeit.	○	○	○	○	○
730)	4. Ich bin mir darüber im Klaren, welche Vorteile für mich am wichtigsten sind.	○	○	○	○	○
731)	5. Ich bin mir darüber im Klaren, welche Risiken und Nebenwirkungen für mich am wichtigsten sind.	○	○	○	○	○
732)	6. Ich bin mir darüber im Klaren, was mir wichtiger ist (Vorteile oder Risiken und Nebenwirkungen).	○	○	○	○	○
733)	7. Ich habe genug Unterstützung von Anderen, um diese Entscheidung zu treffen.	○	○	○	○	○
734)	8. Ich treffe diese Entscheidung ohne Druck von Anderen.	○	○	○	○	○
735)	9. Ich habe genügend Beratung, um diese Entscheidung zu treffen.	○	○	○	○	○
736)	10. Ich bin mir darüber im Klaren, was für mich die beste Wahl ist.	○	○	○	○	○
737)	11. Ich bin mir sicher, wofür ich mich entscheiden soll.	○	○	○	○	○
738)	12. Diese Entscheidung fällt mir leicht.	○	○	○	○	○

739)

13. Ich habe das Gefühl eine informierte Entscheidung getroffen zu haben.	○	○	○	○	○
740) 14. Meine Entscheidung zeigt, was mir wichtig ist.	○	○	○	○	○
741) 15. Ich gehe davon aus, dass ich bei meiner Entscheidung bleibe.	○	○	○	○	○
742) 16. Ich bin mit meiner Entscheidung zufrieden.	○	○	○	○	○

Need for Cognitive Closure

Please complete the survey below.

Thank you!

Entscheiden Sie bitte, wie stark die nachfolgenden Sätze die eigene persönliche Einstellung, Meinung und Er-fahrung ausdrücken.

		stimme gar nicht zu					stimme völlig zu
743)	1. Ich mag es nicht, wenn die Aussage einer Person mehrdeutig ist.	○	○	○	○	○	○
744)	2. Ich finde, nachdem ich eine Lösung für ein Problem gefunden habe, ist es Zeitverschwendung, weitere mögliche Lösungen in Betracht zu ziehen.	○	○	○	○	○	○
745)	3. Ich mag keine unvorhersehbaren Situationen.	○	○	○	○	○	○
746)	4. Ich finde es spannend nicht zu wissen, was das Leben einem bringen wird.	○	○	○	○	○	○
747)	5. Ein Problem aus verschiedenen Blickwinkeln zu betrachten, führt nur zu Verwirrung.	○	○	○	○	○	○
748)	6. Im Allgemeinen suche ich nicht nach Alternativlösungen für Probleme, für welche ich schon eine Lösung parathabe.	○	○	○	○	○	○
749)	7. Ich bevorzuge die Gesellschaft guter Freunde, weil ich weiß, was ich von ihnen zu erwarten habe.	○	○	○	○	○	○
750)	8. Ich fühle mich unbehaglich, wenn ich es nicht schaffe eine schnelle Antwort auf Probleme zu geben, denen ichgegenüber stehe.	○	○	○	○	○	○
751)	9. Ich bevorzuge Tätigkeiten, bei denen stets klar ist, was getan und wie es getan werden muss.	○	○	○	○	○	○

752)

	10. Wenn ich ein Problem lösen muss, verschwende ich im Allgemeinen keine Zeit damit, die unterschiedlichen Standpunkte dazu zu erwägen.	○	○	○	○	○	○
753)	11. Ich mag Aufgaben, bei denen noch unklar ist, wie der genaue Lösungsweg aussieht.	○	○	○	○	○	○
754)	12. Ich liebe die Ungewissheit und die Überraschung, die oft im Alltäglichen steckt.	○	○	○	○	○	○
755)	13. Jedwede Lösung eines Problems ist besser, als in einem Zustand der Ungewissheit zu verharren.	○	○	○	○	○	○
756)	14. Ich ziehe Dinge, die ich gewohnt bin, solchen vor, die ich nicht kenne und die ich nicht vorhersagen kann.	○	○	○	○	○	○
757)	15. Im Allgemeinen vermeide ich es, mich an Diskussionen über uneindeutige und umstrittene Themen zu beteiligen.	○	○	○	○	○	○
758)	16. Ich bevorzuge es, mich für die erstmögliche Lösung zu entscheiden, anstelle lange darüber nachzudenken, wasfür eine Entscheidung ich treffen sollte..	○	○	○	○	○	○

AAQ-II

Please complete the survey below.

Thank you!

Sie finden unten eine Liste mit Aussagen. Bitte geben Sie an, wie wahr jede Aussage für Sie ist, indem Sie eine der Antwortmöglichkeiten auswählen.

	Niemals wahr	Sehr selten wahr	Selten wahr	Manchmal wahr	Häufig wahr	Fast immer wahr	Immer wahr
759) 1. Meine schmerzlichen Erfahrungen und Erinnerungen machen es mir schwer, ein Leben zu leben, das ich wertschätzen würde.	○	○	○	○	○	○	○
760) 2. Ich habe Angst vor meinen Gefühlen.	○	○	○	○	○	○	○
761) 3. Ich sorge mich darum, nicht fähig zu sein, meine Sorgen und Gefühle zu kontrollieren.	○	○	○	○	○	○	○
762) 4. Meine schmerzlichen Erinnerungen halten mich davon ab, ein erfülltes Leben zu haben.	○	○	○	○	○	○	○
763) 5. Emotionen verursachen Probleme in meinem Leben.	○	○	○	○	○	○	○
764) 6. Es scheint, als ob die meisten Leute ihr Leben besser bewältigen als ich.	○	○	○	○	○	○	○
765) 7. Sorgen stellen sich meinem Erfolg in den Weg.	○	○	○	○	○	○	○

Erwartung-Survey

Please complete the survey below.

Thank you!

	völlig unwichtig					sehr wichtig
766) Wie wichtig ist es Ihnen, dass durch das Arzt-Patienten-Gespräch eine Vision ihrer Zukunft erstellt wird?	○	○	○	○	○	○
767) Wie wichtig ist es Ihnen, dass Sie durch das Arzt-Patienten-Gespräch Informationen erhalten und Sie Zusammenhänge verstehen lernen?	○	○	○	○	○	○
768) Wie wichtig ist es Ihnen, dass durch das Arzt-Patienten-Gespräch nur das Wesentliche hervorgehoben wird und Sie mehr Klarheit erhalten?	○	○	○	○	○	○
769) Wie wichtig ist es Ihnen, dass der Therapieplan flexibel im Gegenzug zu vorgegebenen Leitlinien erstellt wird?	○	○	○	○	○	○

Post-interventionelle Erhebung

Bitte beantworten Sie die aufgelisteten Fragen:

	0 Lehne voll und ganz ab	1	2	3	4	5 stimme voll und ganz zu
770) 1. Durch das Arzt-Patienten-Gespräch sind sie besser in der Lage ein Bild Ihrer Zukunft zu malen.	○	○	○	○	○	○
771) 2. Durch das Arzt-Patienten-Gespräch können Sie nun Zusammenhänge besser verstehen.	○	○	○	○	○	○
772) 3. Durch das Arzt-Patienten-Gespräch sind Sie sich nun über das Wesentliche im Klaren.	○	○	○	○	○	○
773) 4. Durch das Arzt-Patienten-Gespräch können Sie sich an die Situation besser anpassen.	○	○	○	○	○	○

Zufriedenheit

Please complete the survey below.

Thank you!

774) Wie zufrieden waren Sie insgesamt mit dem Arzt-Patienten-Gespräch?

- ◯ 10 voll und ganz zufrieden
- ◯ 9
- ◯ 8
- ◯ 7
- ◯ 6
- ◯ 5
- ◯ 4
- ◯ 3
- ◯ 2
- ◯ 1
- ◯ 0 garnicht zufrieden