

A pilot study of patient satisfaction with a self-completed tablet-based digital questionnaire for collecting the patient's medical history in an emergency department

Leander Melms^{1,2*}, Juergen R. Schaefer¹, Andreas Jerrentrup^{1,3}, and Tobias Mueller¹

1 Centre for undiagnosed and rare diseases, University Hospital Gießen and Marburg, Marburg, 35033, Germany

2 Institute of Artificial Intelligence, Philipps-University Marburg, Marburg, 35033, Germany

3 Emergency Department, University Hospital Gießen and Marburg, Marburg, 35033, Germany

* Leander.Melms [at] uni-marburg [dot] de

Evaluation Survey I

01 How old are you?

- FREE TEXT [Numerical Input]

02 sex?

- Male
- Female
- Not specified

03 Mother tongue?

- FREE TEXT

04 Which devices do you use regularly in your private life?

- Mobile phone
- Internet-capable mobile phone / smartphone
- Tablet PC (Tablet)
- Stationary / fixed computer
- None of these

05 I consider my computer skills to be very good.

- Strongly agree
- Rather agree
- Rather not agree
- Strongly disagree

06 What visual impairment do you have?

- Myopia
- Long-sightedness
- None

07 Do you need a visual aid (e.g. glasses, contact lenses)?

- Yes
- No

08 Do you have any of the listed eye diseases?

- Colour blindness
- Macular Degeneration
- Glaucoma / Glaucoma
- Cataract / Glaucoma
- Diabetic retinopathy
- None

09 Do you have any of the listed motor limitations?

- Parkinson's Syndrome
- Rheumatic disease
- Amputations of fingers
- Numbness of the fingers
- Other
- None

Evaluation Survey II

- 01 The tablet was easy for me to use.
- 02 I rate the data protection and data security of the questionnaire as high.
- 03 The questionnaire has helped to clarify my medical concerns.
- 04 The (digital) questionnaire was usually quick to respond.
- 05 The questionnaire was clearly structured.
- 06 The answers to the questions worked perfectly from a technical point of view.
- 07 The time to complete the questionnaire was just right.
- 08 I had no difficulty in understanding the questions.
- 09 The questions seemed appropriate and conclusive to me.
- 10 The handling of the device was easy for me.
- 11 The font was legible.
- 12 The font size was not too small.
- 13 I felt confident to be able filling out the digital questionnaire.
- 14 I feel confident to be able filling out another digital questionnaire in the same format.
- 15 I had the impression that the questionnaire helps to sort my thoughts.
- 16 I was not afraid to damage the device.
- 17 I had no problems understanding the questions, even if medical terms were used.
- 18 I would rather not have filled out a paper and pen version of the questionnaire.
- 19 I was able to fill out everything with the questionnaire in peace and quiet.
- 20 I always knew exactly where to click to answer the questions.
- 21 I always knew what the questions were about
- 22 I would like to have a digital questionnaire again in the future
- 23 I would recommend the digital questionnaire.
- 24 My overall impression is quite positive
- 25 I was completely satisfied with the colour representation of the digital questionnaire
- 26 Unknown terms, if any, were explained
- 27 How satisfied were you with the usability of the digital questionnaire?

Emergency Survey Traumatology

What complaints do you bring to us?

- FREE TEXT

Are you in pain?

- Yes
- No

Where's the pain?

- PICTURE

How bad is the pain?

- POINTS (0 - 10)

When did the pain start?

- since a few days ago
- Suddenly, for several minutes/hours
- for several weeks

How long does the pain last?

- Constant pain with strong fluctuations
- Constant pain with slight fluctuations
- Pain attacks, painless in between
- Pain attacks, in between continuous pain

What character does the pain have?

- pulling
- piercing
- Pressing
- burning
- tearing
- oppressive
- cutting

Is the pain radiating?

- Yes
- No

Where does the pain radiate to?

- Into the chest
- in the legs
- in the shoulder
- in your arms
- at the back
- to the upper abdomen
- in the lower abdomen
- Belt-shaped

Are you taking medication regularly or currently?

- Painkillers
- anticoagulants like Marcumar, Aspirin, Plavix, Xarelto, Pradaxa, Eliquis, Lixiana, Heprarin
- Cardiovascular Drugs
- Antidiabetics especially metformin-containing
- Sleeping pills or tranquilizers
- Hormone preparations

Is there an allergy like hay fever or an allergic asthma or an intolerance of certain substances?

- Iodine
- Pollen
- X-ray contrast medium
- Patch
- Latex
- Drugs

Do infections occur frequently?

- No
- Yes

Do you have frequent bleeding symptoms (e.g. repeated spots on your arms/legs)?

- No
- Yes

Is there a postthrombotic syndrome?

- No
- Yes

Is there a cardiovascular disease?

- Heart attack
- Rhythm disturbances
- high blood pressure
- angina pectoris
- Heart failure

Does shortness of breath occur when climbing stairs?

- No
- Yes

Does a thyroid gland disease exist?

- Sub-function
- Goiter
- Overfunction

Is there a mental illness (depression, borderline syndrome)?

- No
- Yes

Is there an eye disease (cataract, glaucoma)?

- No
- Yes

Are there implants in the body?

- Joint Endoprosthesis
- Metal
- Silicone
- Stent
- Plastics

Has there ever been a scar proliferation like keloid?

- No
- Yes

Has an operation ever been performed, especially on bones, joints, ligaments, tendons or muscles?

- No
- Yes

If so, which ones?

- FREE TEXT

If so, were there any complications (bone/joint infection, healing disorders, circulatory problems, soft tissue calcification)?

- No
- Yes

Has the body area in question already been x-rayed or have examinations been carried out using other imaging methods (ultrasound, nuclear spin)?

- Yes
- No

Have you been vaccinated recently? If so, which ones?

- Tetanus
- Tytanus
- Flu vaccination

Could you be pregnant?

- No
- Yes

Are you breastfeeding?

- No
- Yes

Is there an allergy/sensitivity to metals?

- Nickel
- D-Penicillamine

Is there an acute inflammation or infection?

- Cold
- Fungal infection
- inflammatory skin disease

Is there an infectious disease?

- Yes
- No

Is there vascular disease?

- Coronary heart disease
- other vascular disease
- Arteriosclerosis

Has there ever been a vascular occlusion due to blood clots?

- Yes
- No

Are there or have there been thromboses or vascular diseases in the family (parents, siblings)?

- No
- Yes

If so, with whom and what illness?

- FREE TEXT

Is there low blood pressure or dizziness?

- No
- Low blood pressure
- Swindle

Is there a disease of the liver, gallbladder/bladder?

- No
- Gallstones
- Ignition
- fatty liver

Is there a disease or malformation of the kidneys or urinary organs?

- No
- Kidney stones
- Nephritis
- Renal dysfunction
- Bladder emptying fault

Is there a metabolic disease?

- No
- Diabetes
- Other metabolic disease
- Gout

Does a disease of the nervous system exist?

- No
- chronic pains
- Varicose disorders/epilepsy

Are there other diseases? If so, which ones?

- FREE TEXT

Regular smoking? If so, how much?

- FREE TEXT [Numerical Input]

Regular consumption of alcohol? If so, what and how much?

- FREE TEXT

Emergency Survey Internal Medicine

What complaints do you bring to us?

- FREE TEXT

Are you in pain?

- Yes
- No

Where's the pain?

- IMAGE QUESTIONNAIRE

How bad is the pain?

- POINT QUESTION (0 - 10)

Is the pain radiating?

- Yes
- No

Where does the pain radiate to?

- into the jaw
- in the lower abdomen
- Belt-shaped
- in your arms
- in the shoulder
- in the chest
- in the groin
- in the legs
- to the upper abdomen
- at the back

When did the pain start?

- since a few days ago
- for several years
- Suddenly, for several minutes/hours
- for several weeks
- for several months

How long does the pain last?

- Constant pain with strong fluctuations
- Constant pain with slight fluctuations
- Pain attacks, painless in between
- Pain attacks, in between continuous pain

What character does the pain have?

- stabbing
- pulling
- tearing
- burning
- Pressing
- oppressive
- cutting

Do you have any other accompanying symptoms?

- Anxiety
- Fever
- Nausea
- Breaking of coffee grounds
- Diarrhoea
- Constipation
- Shortness of breath
- Loss of appetite
- Flatulence
- Vomiting
- blood in urine
- Heartburn

Are you known to have a cardiac defect / valve defect?

- No
- Yes

Have you had heart surgery (e.g. bypass surgery)?

- Yes
- No

Are you familiar with bronchial asthma?

- Yes
- No

What's your height?

- SPECIAL NUMERIC FIELD WITH INPUT ASSISTANCE UI

Have you ever had a heart attack before?

- Yes
- No

Has a cardiac catheterization ever been performed before?

- Yes
- No

Was a stent implanted?

- Yes
- No

Are you aware of any cardiac arrhythmias (e.g. atrial fibrillation)?

- Yes
- No

Has there ever been a pulmonary embolism before?

- No
- Yes

Have you been implanted with a pacemaker/defibrillator?

- Yes
- No

Do you have any known constrictions of the vessels (legs, carotid artery, etc.)?

- No
- Yes

Are or were you aware of kidney stones/urinary stones?

- No
- Yes

Which cancer is/was known to you?

- FREE TEXT

Do you have a history of heart failure/heart failure?

- No
- Yes

Are you known to have chronic obstructive pulmonary disease (COPD)?

- No
- Yes

Are you familiar with pulmonary fibrosis?

- No
- Yes

Has there ever been a vascular occlusion due to blood clots (thrombosis, embolism)?

- No
- Yes

Are you or have you been diagnosed with renal dysfunction?

- No
- Yes

Are you a dialysis/CAPD patient?

- No
- Yes

Is a bladder voiding disorder known?

- No
- Yes

Have you ever had a stroke before?

- No
- Yes

Do you have or have you been known to have a spasm/epilepsy?

- No
- Yes

Are you known to have diabetes?

- Yes
- No

Are you aware of any hyperthyroidism?

- No
- Yes

Are you familiar with a goiter/stromata?

- No
- Yes

Do you have an increased tendency to bleed (e.g. frequent nose and gums bleeding, bruises, bleeding after operations)?

- No
- Yes

Are you or have you been diagnosed with cancer?

- No
- Yes

Are you familiar with any of the following infectious diseases?

- HIV/AIDS
- hepatitis B
- No - none

Is there a malignant blood disease (e.g. blood cancer, plasmocytoma)?

- No
- Yes

Do you have anemia?

- No
- Yes

Do you have a history of cirrhosis of the liver?

- No
- Yes

Are you known to have hepatitis?

- No
- Yes

Are or were gallstones known to you?

- No
- Yes

Do you suffer from dysphagia?

- No
- Yes

Are you or have you been diagnosed with a stomach ulcer?

- No
- Yes

Are or were you aware of diverticula in the bowel?

- No
- Yes

Have you ever been operated on before?

- Yes
- No

Operation - What and when?

- FREE TEXT

Do you have high blood pressure?

- Yes
- No

Did one of your parents suffer a heart attack/stroke at a young age (younger than 50 years) or even die?

- No
- Yes

Are you aware of elevated cholesterol levels?

- Yes
- No

You smoke?

- Yes
- No

If so, how much do you smoke per day?

- FREE TEXT [Numerical Input]

If so, for how many years?

- FREE TEXT [Numerical Input]

Do you drink alcohol?

- Occasionally
- Yes
- No
- not any more

What do you consume?

- beer or wine
- Spirituous beverages
- Alcoholic mixed drinks

How much do you consume per day?

- FREE TEXT

How much do you consume per week?

- FREE TEXT

Are you taking or have you taken drugs?

- No
- Yes

If so, which one?

- FREE TEXT

In which countries/regions have you been in the last six months?

- Caribbean
- Southern Europe
- East Asia
- Middle East

If so, when?

- FREE TEXT

Which yes, which country?

- FREE TEXT

Did the complaints occur during or shortly (up to 4 weeks) after a stay abroad?

- No
- Yes

If so, what complaints?

- FREE TEXT

Are you currently pregnant?

- No
- Yes

Have you had any miscarriages?

- No
- Yes

When was the last gynecological examination?

- DATE FIELD

How heavy are you?

- SPECIAL NUMERIC FIELD WITH INPUT ASSISTANCE UI

How's your appetite?

- Normal
- Bad
- Well

Do you have pain/burning when you urinate?

- No

- Yes

Is the urine foamy?

- No
- Yes

What is the color of the urine?

- Clear
- Yellow
- Red

What is the shape of the bowel movement?

- Sausage-like, lumpy
- Single soft, smooth-edged lumps, easy to excrete
- Sausage-like with smooth surface
- Single, solid beads, difficult to excrete
- Liquid, without solid components

What is the color of the bowel movement?

- Brown
- Bright

Do you have a cough?

- No
- Yes

Is the cough accompanied by sputum?

- No
- Yes

Are you sleeping soundly?

- No
- Yes

Are you having trouble breathing?

- No
- Yes

Do you sweat more at night?

- Yes
- No

Have you noticed any fever or increased temperature?

- No
- Yes

Have you lost weight unintentionally lately?

- No
- Yes

Do you suffer from swollen legs (edema)?

- Yes
- No

Do you have any known allergies or intolerances?

- No
- Yes

Is an allergy/intolerance to medication known?

- No
- Yes

Is an allergy/intolerance to latex known?

- No
- Yes

Is an allergy/incompatibility to disinfectants known?

- No
- Yes

Is an allergy/intolerance to X-ray contrast medium known?

- No
- Yes

Is an allergy/intolerance to plasters known?

- No
- Yes

Is an allergy/ intolerance to food?

- No
- Yes

Allergy/intolerance to food - if yes, which ones?

- FREE TEXT

Is your vaccination card ready?

- No
- Yes

Do you have a list of your medication with you?

- Yes
- No

Can you name any medications you take?

- No
- Yes

Are there any medications that you only take when needed?

- No
- Yes

Are there any medications that you or your doctor recently stopped or changed?

- No
- Yes

Have you taken any antibiotics in the last three months?

- Yes
- No

Do you take medication that you buy at the pharmacy without a prescription from the doctor?
For example, aspirin, laxatives, heartburn remedies.

- No
- Yes

Do you use eye drops? Ear drops? Nose drops? Nose sprays?

- No
- Yes

Are you taking any anticoagulant medication? For example, Marcumar, Aspirin, Plavix, Xarelto, Pradaxa, Eliquis, Heparin

- No
- Yes

Are you taking antidiabetics (e.g. metformin)?

- Yes
- No

Do you take hormone supplements? Thyroid medication, birth control pills...

- Yes
- No

Hormone preparations - if so, which ones?

- FREE TEXT

Antidiabetics - if so, which ones?

- FREE TEXT

Are you taking sleeping pills and/or sedatives?

- No
- Yes

Drugs - if so, in what strength/ how often?

- FREE TEXT

Do you live alone?

- Yes
- No

Are you married?

- No
- Yes

Do you live in a stable partnership or in a domestic community?

- No
- Yes

Do you live in a retirement or nursing home?

- No
- Yes

Do you have a care level or degree of care?

- Yes
- No

Have you noticed recently that you have had less interest or pleasure in your activities?

- No
- Yes

Have you been feeling depressed, melancholy or hopeless lately?

- No
- Yes

What is your profession?

- FREE TEXT

Do you avoid crowds, public places, travelling alone or far from home?

- No
- Yes

Have you felt affected by nervousness, anxiety, tension, panic attacks or excessive concern in the last few weeks?

- No
- Yes

Which infectious disease are you familiar with?

- FREE TEXT

Are you aware of any thyroid dysfunction?

- No
- Yes

How many children have you born?

- FREE TEXT [NUMERICAL]

Miscarriages - if so, how many?

- FREE TEXT [NUMERICAL]

What form of contraception do you use?

- Other
- Spiral
- Preservative

How often do you have to urinate each day?

- FREE TEXT [NUMERICAL]

How often do you have to urinate at night?

- FREE TEXT [NUMERICAL]

How often do you have to have bowel movements during the day?

- FREE TEXT [NUMERICAL]

How many litres do you drink a day?

- FREE TEXT [NUMERICAL]

What colour is the sputum?

- Clear
- Yellow
- Green

Weight lost - if yes, how many kg?

- FREE TEXT [NUMERICAL]

Weight lost - if yes, in which period?

- FREE TEXT [NUMERICAL]

Incompatibilities - if so, which ones?

- Food, animal hair, hay fever
- Penicillin
- Hay fever
- patches, anaesthetic
- Lactose
- Cat

Allergies/intolerances to medicines - if so, which ones?

- FREE TEXT

Drugs - if so, which ones?

- FREE TEXT

Medication - if yes, when was the last time you took it?

- FREE TEXT

Medication as needed - if so, which?

- FREE TEXT

Medications discontinued - if so, which ones?

- FREE TEXT

Drugs without prescription - if so, which ones?

- FREE TEXT

Drops or sprays - if so, how many drops - how often - into which eye/ear?

- FREE TEXT

Anticoagulant drugs - if so, which ones?

- FREE TEXT

Sleeping pills and/or sedatives - if so, which ones?

- FREE TEXT