

## Research Article

# Effectiveness Analysis of a Psychosocial Guidance System in Maternity Clinics

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Prenatal stress and early childhood experiences of psychosocial stress can have lifelong health consequences for affected children. Despite the existence of various support services, these services are not always utilized well, especially by families who have a high need for support. The intervention “Babylotse” [engl. Baby pilot] consists of a screening system to connect stressed families with various help settings, according to the needs of the family. The present quasi-experimental study investigated the effectiveness of this intervention by examining the children's quality of life one year after taking part in the intervention. The physical development of N = 129 children, as well as the social and living space of the family, were examined, by a nurse at the family's homes. Parents were interviewed beforehand about their living situation on the phone. There were no significant differences between the children in the intervention group consisting of psychosocially significant stressed families according to the screening and the control group consisting of families not burdened by psychosocial stress, which suggests the positive effect of the intervention by making up for the existing deficits.

**Keywords:** Early childhood experiences; Psychosocial family stress; Early childhood intervention; Family intervention

## Introduction

### Current research

An increasing body of research indicates that a large proportion of pregnant women and mothers with infants, are affected by psychosocial stress [1-3]. Psychosocial stress factors during and after pregnancy include mental disorders (depression, anxiety), violence and conflicts in the partnership, problems and worries regarding the life situation (such as unemployment and financial difficulties), pregnancy-specific fears and worries regarding the birth or excessive demands about raising and caring for the children (single parent, with the partner). It is even possible that several risk factors are combined, as multiple factors can often be experienced at the same time [1-3]. These factors not only affect the well-being and health of the mother but can also have an impact on the development and health of the child [1-3]. This can have both short and long-term consequences for the children, with effects lasting into adulthood [4,5]. Keeping that in mind, some stress factors can already influence the health and development of the child prenatally, through physiological processes such as through the neuroendocrine system, or health-related behaviours during pregnancy, such as smoking or consuming alcohol during pregnancy [4,5]. External factors can also have a negative influence on child development after pregnancy. For instance, growing up in inadequate living conditions, such as poverty and cramped living conditions, can exert an influence [6].

Parental psychosocial stress factors continue to have a negative influence on the healthy development of children, even after pregnancy [7]. Recognizing psychosocial stress is subsequently important during and after pregnancy to prevent negative consequences for children. Even though a variety of support services (counselling

centres, psychotherapeutic care, child and youth services) are already available for the psychosocial care of pregnant women and mothers, we often encounter a so-called prevention dilemma [8]. This implies that particularly highly stressed families are difficult to reach, or the utilization of support services is low among this group [9,10]. This prevention dilemma manifests itself due to various circumstances. These often include shame and fear, a lack of awareness of the problem or a lack of knowledge about available services [11,12]. There are different levels of services available depending on the catchment area. In western countries in rural areas, there is often a lack of offers, while in inner-city areas there is an excess of offers which can have an overwhelming effect [12]. In contrast to the utilization of social support services, medical care during and after pregnancy is frequently used. Nowadays, almost all children in Germany are born in maternity clinics, and pre-examinations by the gynaecologist as well as paediatric check-ups by the paediatrician are also well taken up [13]. Attending these examinations has a high acceptance rate in Germany and is less stigmatizing compared to child and youth services [13]. Women are more inclined to express their desire for psychosocial counselling by gynaecologists in such settings [1]. It can thus be seen that maternity clinics, gynaecologists in private practices and paediatricians represent an important access route to mothers under stress during pregnancy and after birth and offer a central interface to the help system.

### The psychosocial guidance system “Babylotse”

The early childhood intervention “Babylotse” [engl. Baby pilot] is supposed to pose an intersection between support systems and medical facilities. In this intervention, systematic access to regional support systems such as family midwives, family mentors or other services such as “early childhood intervention” or the responsible

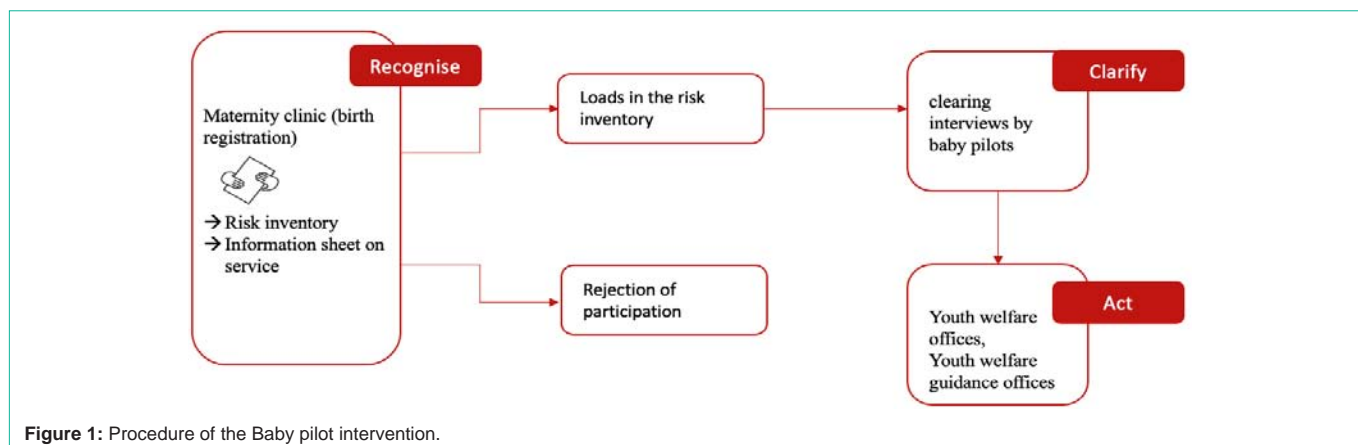


Figure 1: Procedure of the Baby pilot intervention.

regular systems was developed in Germany. The focus was on families with children between 0 and 3 years of age whose life situation is characterized by a high level of stress and diverse and/or serious risks in its design, the project referred to the findings of the German previous studies investigating psychosocial risks in families early intervention [14]. The risk factors identified there included psychiatric illnesses of the parents, possible drug ad-diction of the parents, cramped living conditions, poor education on the part of the parents and young age of the parents, unwanted pregnancy or situations where parents were bringing up their children alone. In addition, pro-protective factors included good language development, external support systems, emotional ties in the family and characteristics of the child that trigger a positive reaction in its social environment [15].

The Babytlotse intervention was first implemented in maternity clinics in Hamburg, Germany. The goals of the assessment of parental risk factors and the referral to low-threshold support programs for psychosocially highly stressed families with newborn children were the following:

- Early identification and, if possible, reduction of high-risk factors for child neglect and abuse
- Establishing empathic initial contact with the family
- Strengthening parental and child protection factors
- Ensuring that the child’s emotional, physical and intellectual development is as undisturbed as possible (Figure 1).

The stress anamnesis, consisting of screening and clearing interview, is used by a social worker called “Babytlotse” [Baby pilot] to determine the need for help.

To record these risk factors, screening was carried out for each participating family, in which points were awarded according to the applicable risk factor. The number of points awarded ranged from 0 to 25 points, whereby multiple answers to individual risk factors were possible. Risk questionnaires (evaluated by Fisch et al. [16]) with a total score of ≥ 2 were immediately forwarded to the Baby pilots. Different risk factors were weighted with different points (see Table 1). For example, factors such as low birth weight, smoking during pregnancy or the young age of the mother (< 22 years) were assessed with one point, while special social prob-blems (migration, economic), the psychological stress of the parents (family, occupational) or

Table 1: Risk factors and their quantifier.

| Risk factors                                            | Quantifier |
|---------------------------------------------------------|------------|
| Age of mother ≤ 22 years                                | 1          |
| Smoking during pregnancy                                | 1          |
| Age of father ≤ 18 years                                | 1          |
| Age of the father ≤ 22 years                            | 1          |
| Indication of addiction issues in the father            | 1          |
| Diagnosed psychiatric illness of the father             | 1          |
| Late start of prenatal care                             | 1          |
| ≤ 5 prenatal care visits attended                       | 1          |
| Birth weight < 3 <sup>rd</sup> percentile               | 1          |
| Multiple births (e.g., twins, triplets...)              | 1          |
| Frequent pregnancies (more than 4 children)             | 1          |
| Age of mother ≤ 18 years                                | 2          |
| Specific social problems (migration, economic)          | 2          |
| Specific psychological stress (family, work)            | 2          |
| Previous/existent connection to supportive Institutions | 2          |
| Diagnosed psychiatric illness of the mother             | 3          |
| Indication of addiction issues in the mother            | 3          |

the very young age of the mother (< 18 years) were assessed with a point factor of 2. The highest weighting was given to factors such as a diagnosed mental illness of the mother or an indication of an addiction problem of the mother (Table 1).

Families with psychosocial stress in the screening were asked to attend a clearing interview to clarify the family’s framework conditions in detail and to build up motivation to seek help (clarifying).

Together with the family, possible assistance services are considered and finally selected within the framework of socio-educational assistance planning (Acting).

All families are accompanied up to one year after the birth if desired and the assistance plan is adapted to the family situation.

**Present Study**

The present study investigated the effectiveness of the baby pilot intervention to find out whether the early childhood intervention

**Table 2:** Results on the social space of the child.

|                                                            | The Social Environment Of The Child (N=129) |               |            |
|------------------------------------------------------------|---------------------------------------------|---------------|------------|
|                                                            | Intervention Group                          | Control Group | Total      |
|                                                            | M (SD)                                      | M (SD)        | M (SD)     |
| The ratio of flat size to family size                      | 1.9 (0.80)                                  | 1.5 (0.73)    | 1.7 (0.80) |
| Hygiene in the apart/house                                 | 1.2 (0.51)                                  | 1.1 (0.39)    | 1.2 (0.46) |
| Ensured protection from hazards                            | 1.6 (0.69)                                  | 1.5 (0.54)    | 1.6 (0.63) |
| Sleeping space of the child                                | 1.7 (0.74)                                  | 1.3 (0.63)    | 1.5 (0.71) |
| Play opportunities for the child                           | 1.5 (0.76)                                  | 1.1 (0.44)    | 1.3 (0.66) |
| Financial/material situation                               | 2.1 (0.73)                                  | 1.7 (0.84)    | 1.9 (0.80) |
| Family relationships                                       | 1.4 (0.75)                                  | 1.1 (0.36)    | 1.3 (0.62) |
| The social situations of the family/supportive environment | 1.5 (0.77)                                  | 1.3 (0.63)    | 1.5 (0.72) |
| Communication with the child                               | 1.1 (0.62)                                  | 1.1 (0.55)    | 1.1 (0.59) |
| Observation of the duty of supervision (guardians)         | 1.0 (<0.01)                                 | 1.0 (0.13)    | 1.0 (0.09) |
| Health situation of the guardians                          | 1.3 (0.46)                                  | 1.1 (0.44)    | 1.2 (0.46) |

influences the development of the children of families with psychosocial stress. Based on studies of the family's life situation or quality of life, it was examined how children in the intervention group consisting of psychosocial significant stressed families according to the screening who were supported by social workers differed from children in the control group consisting of families not burdened by psychosocial stress who had no contact with the social workers one year after birth regarding their quality of life, physical development as well as social and life space.

## Methods

### Sample

The paediatric health check by the follow-up nurse was carried out on N = 129 children. Of these, n = 70 children (54%) came from families in the intervention group and n = 59 children (46%) from families in the control group. The girls and boys examined were children born in a maternity clinic in Hamburg. For n = 83 families, a feedback from the related was given, which were divided into n = 47 (57%) cases from the intervention group and n = 36 (43%) cases from the control group.

The families in the intervention group were those who showed psychosocial risks in the screening (This included the families who had achieved a risk sum score of 2 or more points) and who received consultation by the social workers/baby pilots. Families in the control group displayed no psychosocial risks in the screening (screening result with a score of 0 to 1.) and received no consultation by the baby pilots.

The majority of cases screened as unclear or conspicuous had a risk sum score of 2 or 3 points (N = 68; 52%). Very high sum scores of 8 or more points were present in 5% of the cases.

### Procedure

A positive vote of the Ethics Committee of the Hamburg Medical Association (PV3129) was obtained in advance for the execution of the study.

To test the benefit of the baby pilot intervention, an effectiveness analysis was carried out. In the analyses, a comparison was made in a

quasi-experimental study design with a longitudinal section between the families of the intervention group (with social worker contact) and the families of the control group (without social worker contact) who were assessed as conspicuous or unclear concerning the quality of life, health status of the child and parent-child interaction. The families in the control group were those who left the maternity clinic with an insignificant screening.

All parents in the sample who had a "conspicuous screening" and "unclear screening" (intervention group) were asked via telephone interview about their living situation and quality of life close to their child's first birthday. The invitation to participate in the health screening and the parent-child interaction test was issued in writing. Just like the intervention group, the control group was informed about the study at the maternity clinic and motivated to participate and to give informed consent. The randomization procedure established for screening analysis was used to select the control group sample from the clinic database. An invitation to participate in the health examination on the child's 1st birthday with subsequent parent-child interaction testing was subsequently sent in writing. After the telephone interview about the living situation interview took place, the follow-up nurse visited each family at home to conduct the health examination on the children, on their first birthday and gain insight into the families' living space.

For participation in the screening examinations, after completion of the examinations by the follow-up nurse, the families were asked to sign the confidentiality agreement for the written survey of the respective paediatrician on chronic diseases and disabilities as well as regular participation in the standardized examinations on a fax form. If the paediatrician agreed to the survey, the questionnaire consisting of three items was faxed to the paediatrician and he was asked to return the completed form to the research team.

### Research tools

**Health examination:** The health examination of the status of the child's physical and psychological development was carried out by a pediatric nurse with follow-up experience from the Wilhelmstift Children's Hospital at the families' homes. The standardized examination included the physical examination, the assessment on

the level of care and the identification of domestic violence.

The standardized physical examination is completed at the well-child visits 12 months after birth through a developmental psychological test according to the Development Test for children from 6 months to 6 years (ET-6-6) or the advanced medical check-up for children (EVU) (height, weight, motor skills, behaviour according to [17]). The ET-6-6 is a criterion-referenced diagnostic instrument designed to assess normal child development. The task composition of the instrument is based on the landmark principle [17], which establishes basic developmental neurological skills that are considered essential for further undisturbed development. Here, body motor skills, hand motor skills, cognitive development, language development, social development, and emotional development are determined via various tasks with different objects (foam ball, rubber squeaky ball, wooden balls, etc.).

The assessment of the state of care was recorded according to recommendations for action of the Allgemeinem Sozialen Dienst (ASD) [18]. This involves contacting the family and the children concerned when a report on the children's condition is received by the relevant authority. Different areas of risk are then differentiated, observed and documented to obtain an initial overall assessment. This overall assessment then provides a basis for further action depending on the assessment, which is divided into three situations: "Good to Satisfactory Situation", "Sufficient Situation", and "Deficient Situation" [18].

The identification of domestic violence is recorded using the Domestic Violence guideline of the Hamburg Medical Association [19]. This serves as a guide for the diagnosis, documentation and case management of domestic violence among children and adolescents. After the health check, the families were then asked about their satisfaction with the development of their children. They were asked to answer how satisfied they were with their children's development on a 1-5 scale ranging from 1 = "excellent" to 5 = "very poor".

#### Examination of the family's living situation and quality of life:

To examine the family's living situation and quality of life, assessments of problems in the living space were recorded on one side and the family's satisfaction with life on the other. The recommendations for action of the ASD Hamburg [18] were also used to assess problems in the living space. Regarding the assessment of the child's social setting, with the help of a 3-stage assessment, there were no significant differences between the groups. The mean value refers to the rating scale 1 = "good", 2 = "average", 3 = "poor". Families were also asked how they rated their overall life satisfaction over the past week on a 1-5 scale ranging from 1 = "excellent" to 5 = "very poor".

## Results and Discussion

### Health examinations

In comparison between the intervention group that participated in the Babytots intervention and the children in the control group, the intervention group had in average a significantly smaller head circumference ( $M = 46$  cm,  $SD = 1.8$  cm) than the control group ( $M = 47$  cm,  $SD = 2.08$  cm). There were no significant differences between the groups in terms of behavioural observation. The majority of all screened children in both groups responded to whispered addresses (89%), already spoke in two syllables or symbolic language (95%),

showed an understanding of prohibitions (98%), looked at objects (99%), made contact with others on their initiative (95%) and were able to distinguish between familiar and unfamiliar people in their behaviour (92%). The groups showed no differences.

The level of development of body motor skills showed similar results for children in both groups. Comparable numbers of children in both the intervention and control groups were able to sit freely (97% and 95% respectively) or take off clothes independently (93% and 92% respectively) at the time of the health check.

During the examination, all parents of both groups had the opportunity to give free text information on behavioural and physical motor development. The following answers were given several times:

- Physical developmental delays, e.g., learning to walk, motor problems ( $n=11$ )
- Self-regulation difficulties, e.g., sleep-wake rhythm, emotion regulation ( $n=4$ )
- Health problems ( $n=4$ )
- Linguistic developmental delays ( $n=3$ )

In one child (1%) of the families from the intervention group and in none of the children of the control group, signs of injuries without explainable, innocuous causes could be detected by the follow-up nurse.

The survey of the paediatricians on the status of preventive medical checkups and existing chronic diseases or disabilities of the children included in the project showed that on average a comparable number of children in the control and intervention groups had participated in all preventive medical checkups (88% intervention group and 90% control group, respectively). The paediatricians had also diagnosed them with chronic diseases or disabilities with similar frequency (13% intervention group and 11% control group, respectively).

When parents were asked about their satisfaction with the children's development, there were no significant differences between the groups. The parents of the intervention group indicated a satisfaction of 97%, while the parents of the control group indicated a satisfaction of 95%.

### Life situation or quality of life of the family

There were no differences between the intervention and control groups in terms of the quality of life and situation of the families as assessed by the follow-up nurse. In all cases, the condition of personal hygiene ( $M = 1.1$ ,  $SD = 0.47$ ), weather-appropriate clothing ( $M = 1.0$ ,  $SD = 0.09$ ) and the provision of health care and preventive care ( $M = 1.0$ ,  $SD = 0.22$ ) was rated as "good" on average (Table 2). In both groups, however, the age-appropriate nutrition ( $M = 1.2$ ,  $SD = 0.39$ ) and the nutritional condition of the children ( $M = 1.9$ ,  $SD = 0.36$ ) were assessed as slightly worse on average.

Comparisons with the control group were made between the ratio of flat size to family size ( $M = 1.5$ ,  $SD = 0.73$  versus  $M = 1.9$ ,  $SD = 0.80$ ), the child's sleeping place ( $M = 1.3$ ,  $SD = 0.63$  versus  $M = 1.7$ ,  $SD = 0.74$ ), the stimulation and play opportunities for the child ( $M = 1.1$ ,  $SD = 0.44$  versus  $M = 1.5$ ,  $SD = 0.76$ ), the financial situation ( $M = 1.7$ ,  $SD = 0.84$  versus  $M = 2.1$ ,  $SD = 0.73$ ), the family relationship



situation ( $M = 1.1$ ,  $SD = 0.36$  versus  $M = 1.4$ ,  $SD = 0.75$ ) and the social situation ( $M = 1.3$ ,  $SD = 0.63$  versus  $M = 1.5$ ,  $SD = 0.77$ ) were rated significantly worse by the follow-up nurse for the families in the intervention group. For other areas examined, such as hygiene in the household ( $M = 1.2$ ,  $SD = 0.46$ ), protection against dangers ( $M = 1.6$ ,  $SD = 0.63$ ) or the health situation of the caregiver ( $M = 1.2$ ,  $SD = 0.46$ ), however, the assessments were comparable for both groups (Table 2).

Parents of both groups, were also able to give free text information about the social space. The following were mentioned:

- Problematic housing situation, e.g., too small or lack of safety (n=8)
- Health problems of the parents (n=8)
- Psychological support needed, e.g., mother-child care, psychotherapy (n=6)
- Financial difficulties (n=3)
- Problematic relationship or family situation (n=2)

In the free text information on the living situation, the parents gave the following answers:

- Financial problems (n=19)
- Problematic housing situation, e.g., flat too small, lack of hygiene, shame (n=14)
- The problematic situation in the social environment, e.g., relationship problems, problems in the neighbourhood, social isolation (n=14)
- Unemployment/uncertain job situation (n=13)
- Illness/accident (n=9)
- Migration-related problems, e.g., language, residence status (n=5)

When asked about their general life satisfaction, taking into account the past week, both the parents of the Babytote and those of the control group indicated an average life situation rated as "good" ( $M = 3.0$ ,  $SD = 1.00$ ).

## Discussion

The family intervention "Babytote" was evaluated longitudinally in a control group design concerning its effectiveness on the child's state of health as well as the family's living situation by conducting a health examination. Within the framework of this health examination and the associated home visits by the paediatric nurse one year, after the child was born, an assessment of the overall situation after completion of the social worker contact can be undertaken. The health assessment was conducted on  $N = 129$  children, of which  $n = 70$  children belonged to the intervention group and  $n = 59$  children to the control group. Thus, psychosocially stressed families with social worker contact, who had given their consent to participate in the evaluation study, could be visited in their home environment one year after birth and the child's health status and the family's living situation could be recorded.

In line with the question of the study after one year there were

no differences between the families cared for by a social worker and the unaffected families. This means that the previously burdened families of the intervention group also received the same good results in aspects such as health, quality of life, social situation, and others as the parents of the non-burdened families. In this case, the non-significant difference between the groups should be interpreted positively.

In terms of physical development, the baby guide and control groups only differed significantly in head circumference. There were no differences in behaviour or in the level of development of body motor skills. Parents in both groups were also similarly satisfied with their child's development. There were also no significant differences between the groups in the assessment of the child's level of care and the care situation. Accordingly, clothing, personal hygiene, and age-appropriate nutrition were assessed as "good" by the paediatric nurse for all children examined. However, there were significant differences in the assessment of the child's social space by the paediatric nurse.

Compared to the control group, the families with social worker contact in the intervention group showed significantly worse scores in some areas. The financial and material situation of the family as well as the ratio of the size of the apartment to the number of family members were assessed as problematic. Furthermore, the child's sleeping place, the available play opportunities, as well as the family relationship situation, were assessed to be less good in the intervention than in the control group without psychosocial support needs. Despite significant differences in the external factors of the social space, no significant differences were found in the life satisfaction of the families. Both the control and intervention groups generally rated their life situation as "good" at present. In one case, injuries with no identifiable cause were noted by the paediatric nurse during the health examination. This family was also in contact with the baby helper and was reported back to them. The consultation with the treating paediatricians showed a comparable number of families who participated in all screenings for both groups.

## Interpretation of the Results

The results of the health assessment show no significant differences between the intervention and control groups, except for the average head circumference of the children. This may indicate that the intervention was able to counteract to some extent the risk factors that were present in the respective families of this group. The significant differences between the two groups in the examined areas, concerning the intervention group, support the moderating effect of the social status of the families. These families were considered to be psychosocially stressed and received the accompaniment of the social worker also out of economic stress. One of the main problems identified in the first screening was that a high proportion of families had problems with their housing situation (11%). This could explain the significant differences in housing size and where the child sleeps. Since at the first screening almost a quarter of the families (23%) who came into contact with social workers already had economic burdens as a major reason for contact, including assistance from the authorities and debts, it is not surprising that significant differences in the financial situation between the groups emerge, since here the baby pilot intervention probably had little influence.

## Limitations

There are some limitations to be mentioned relating to the present study. The study comprised a quasi-experimental design investigating health and developmental outcomes of children one year after their mothers received the intervention. Thus, the participants were not randomly assigned to either control or intervention group, but families with psychosocial risks were compared to a non-stressed control group. The current study design was chosen as an alternative to examine the effectiveness of the intervention due to ethical issues. However, the quasi-experimental study design limits the degree of evidence of the study results. Moreover, other factors that could have exerted an influence on the investigated outcomes such as support from private social networks, characteristics of the children or their mothers were not considered in the analysis. Thus, we cannot conclude whether the results of the study can be only attributed to the consultation by the baby pilots. Furthermore, the study did not comprise a pre-post testing of the outcomes, but only included one measurement point. Therefore, we do not know whether there were differences between the intervention and control group to begin with.

## Conclusions

Despite the limitations, the present study shows only minor differences between children of psychosocially risked families and the healthy control group. The health assessment showed no significant differences in the physical and motor development of the children, regardless of whether they participated in the family intervention or not. Thus, the children of both groups were equally developed despite the presence of psychosocial risks in the intervention group. This finding could be due to the consultation and by the social workers on the part of the Babylotse intervention.

To show further changes in the developmental psychological area of the children, a new survey of the parents in the experimental condition on the second birthday of the child could represent the renewed current living situation of the children. The sustainability of the baby pilot measure and the actually used access to the help system could be analysed at a later point in time through catamnestic health examinations.

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