

Measuring the use and career histories of drug users in treatment: reliability of the Lifetime Drug Use History (LDUH) and its data yield relative to clinical case notes

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Abstract

Introduction and Aims. There is no generally accepted clinical or research instrument available for recording the longitudinal course of a drug-using 'career'. This paper reports on an initial examination of the properties of the Lifetime Drug Use History Questionnaire (LDUH), built around monthly mapping of drug use patterns in relation to other life events.

Design and Methods. Forty heroin and cocaine users completed structured interviews at two treatment sites. Twenty subjects were interviewed on two occasions separated by a 3-day interval, using either the same interviewer ($n = 10$) or two different interviewers ($n = 10$) as assessments of inter-rater and test–retest reliability. **Results.** Very good inter-rater agreements were observed, demonstrated by Cronbach's alpha and intraclass correlation coefficients generally higher than 0.8 and 0.7, respectively. Additionally, concordance with clinical notes was assessed for four drug use history variables, resulting in poorer rates of agreement. An exact matching with clinical records was obtained for the variable 'age of first use of heroin' in 47.2% ($n = 17$) of the heroin users, while a good agreement (only 1 or 2 years' difference) was found in 36.1% of cases ($n = 5$).

Discussion and Conclusions. The LDUH method resulted in high reliability for heroin and cocaine and suggests an effective, clinically applicable method for history-taking. The paucity and inconsistency of similar information in the clinical notes would further justify the use of a standardised method for recording drug histories. [Day E, Best D, Cantillano V, Gaston RL, Nambamali A, Keaney F. Measuring the use and career histories of drug users in treatment: reliability of the Lifetime Drug Use History (LDUH) and its data yield relative to clinical case notes. *Drug Alcohol Rev* 2008;27:171–177]

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Introduction

Drug dependence is considered a heterogeneous and chronic illness, associated with complex use patterns and co-morbidities, and with varying links to criminality, aberrant social networks and employment problems [1]. Longitudinal studies have been important in exploring the stages of drug-using 'careers' (DUC), revealing long-term patterns of drug dependence and its consequences [2]. Research suggests that the most cost-effective way of reducing drug harm is to encourage drug users into treatment [3], retaining

them for at least 3 months [4] and delivering appropriate services to meet their needs [5]. Instruments have been developed for multi-dimensional evaluation of drug and alcohol outcomes, some of which have demonstrated reliability and validity as assessment instruments, but few have bridged the gap to clinical practice, with validated scales focusing primarily on recent use patterns and collecting limited information on addiction careers.

The concept of 'drug-using' or 'addiction' careers refers to a longitudinal characterisation of an individual's use of drugs over a lifetime [6]. Nurco *et al.* [1] initiated research efforts in this area by developing a

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typology based on the concept of opportunity and motivation to use narcotics [1,7,8]. The term 'treatment career' has been used to characterise cycles of treatment, abstinence and relapse, which vary in length, characteristics and outcome [5].

There has been increasing interest in the development of procedures to improve retrospective data collection for a range of drug and alcohol problem-using populations. Self-reports of substance use are economical and easy to obtain, providing information over longer periods than biological markers, and giving information about use patterns that other measures cannot capture [9,10], and there is evidence supporting the reliability and validity of self-reported substance use [11–13] and criminal activity [14]. While some respondent characteristics (heavy substance use, high rates of criminal involvement) can affect reporting, consistent information on criminal activity can be obtained from opioid users under appropriate conditions [13,14]. None the less, Lemmens [15] has argued that reliability decreases as the period of recall increases.

Self-report procedures to obtain information regarding drug and alcohol histories have included the Lifetime Drinking History (LDH) [16] and other calendar methods [17,18], such as time-line follow-back (TLFB) [11]. The TLFB was developed in the 1970s, and has demonstrated validity and reliability for assessing alcohol misuse in a variety of settings and with varying reporting intervals [11,12]. It has also been extended to the assessment of problematic heroin and cocaine users [10], but has some limitations when evaluating patients with highly variable patterns of consumption [10]. The Lifetime Drinking History (LDH) is a structured interview designed to provide quantitative data on lifetime patterns of alcohol consumption. This method has a reasonable level of reliability [16], and provides important clinical information about changes in drinking patterns through the life of subjects.

A similar method, the Life Chart Method (LCM), has been used by psychiatrists to explore the lifetime pattern of relapsing and remitting disorders [19]. Kraepelin developed a semi-quantitative scheme for charting fluctuations in mood in the early 20th century, and this was adapted and extended by a National Institute for Mental Health (NIMH) research group [20]. The LCM has demonstrated validity and reliability in the evaluation of bipolar disorder; part of its usefulness is that it is able to provide a graphical representation of the longitudinal course of an illness [21]. The advantages of this method are its accurate evaluation of episode patterns, the elucidation of environmental events related to the episodes, better delineation of treatment response and greater understanding of the longitudinal patterns of the illness, which have benefits in patient management [22].

Different approaches for studying self-reported drug and alcohol use history have been described, with diverse methodologies and strengths. However, there is currently no widely accepted instrument for recording the longitudinal course of a DUC and its response to treatment in clinical or research settings. Therefore, our research group has developed the Lifetime Drug Use History Questionnaire (LDUH), a clinician-administered questionnaire that combines the principles of TLFB, the Life Chart Method and a quantitative evaluation of drug use with a retrospective longitudinal assessment of drug history. One of its objectives is to display graphically the interaction between quantity and frequency of drug use with different variables across the life course, leading to a multi-dimensional assessment of the life history of substance use and how this relates to different forms of treatment uptake and treatment effectiveness.

Method

This study set out to test the psychometric properties of the LDUH. It was hypothesised that the LDUH instrument was reliable when used in opioid- and cocaine-misusing populations. This pilot analyses lifetime use of heroin and cocaine. The LDUH consists of 13 sections:

- Section 1: demographic information.
- Sections 2–9: summary information on all drugs the subject has used in a problematic way in their life, including age of first use and first daily use, highest dose and history of injecting.
- Section 10: drug use month by month throughout the whole DUC, recording typical frequency, quantity and route of administration for each month.
- Section 11: treatment received, including prescribing (where appropriate), agency type and number of sessions per month, including treatments mandated through criminal justice.
- Section 12: self-reported criminal justice involvement (including periods of imprisonment, convictions and arrests) and description of offences committed.
- Section 13: key life events, including training and education, housing, relationships, family and health. It is also possible to include other relevant life events, mainly to provide anchor points for improving recall in sections 10–12 [23].

Procedure

Two sites were selected: an out-patient community prescribing service and an in-patient detoxification unit, both parts of the South London and Maudsley

NHS Trust. Interviewers were clinicians in training at South London and Maudsley NHS Trust. The first author videoed the initial cases and this was shown to the trainees, who were then monitored in their initial interviews by the first author. Interviews were conducted between July and August 2005. All participants were paid £10 in the form of a shopping voucher for completing the interview.

Participants

All subjects had a diagnosis of opiate or cocaine dependence syndrome according to the *International Classification of Diseases* version 10 (ICD-10) diagnostic criteria [24], and were aged between 18 and 65 years. Clients were excluded if they were intoxicated or were experiencing severe withdrawal, if they had a severe medical illness or co-morbid psychiatric disorder, or presented with cognitive problems that would interfere with the ability to provide informed consent. Two clients were excluded, one for cognitive problems and one for severe withdrawals.

Ethical considerations

All patients provided informed written consent to participate and to access their clinical records as a documentary source of concurrent validity. The Local Research Ethics Committee for the South London and Maudsley NHS Trust approved the study at its meeting on 17 June 2005.

Statistical analysis

Reliability. Forty participants completed the LDUH, of whom 20 were interviewed on two occasions, to test different aspects of reliability. Test–retest and inter-rater reliability was ascertained from 20 subjects in the sample; 10 were interviewed twice by the same clinician and 10 by different clinicians within a 3-day interval, as shown in Figure 1. All those interviewed for the study ($n = 40$) were used for the comparison with clinical case notes.

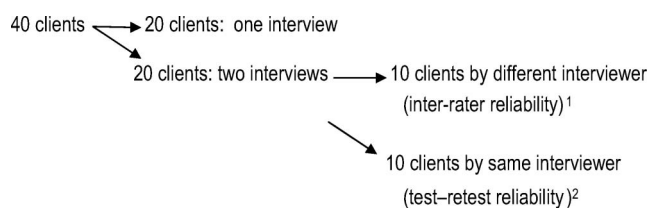


Figure 1. Flow of clients in the study design. ¹For inter-rater reliability, 10 participants were interviewed by two different clinicians, the interviews separated by 3 days. ²For test–retest analysis, all 20 interviewees were included irrespective of whether the same interviewer conducted the interview.

Nine items from the instrument were selected to test reliability: ‘length of drug using career’, ‘number of phases of heroin use’, ‘number of phases of crack cocaine use’, ‘number of periods of out-patient treatment’, ‘total length of all out-patient treatment’, ‘number of imprisonment periods’, ‘total length of time in prison’, ‘number of phases of heroin abstinence’ and ‘number of phases of crack cocaine abstinence’. Each item was compared with the correspondent response for the second interview to provide an estimation of test–retest consistency. Reliability was measured using the intraclass correlation coefficient (ICC) [25,26] and Cronbach’s alpha coefficient [26], based on a power calculation showing that a correlation of 0.80 would require a sample size of 10 (at the $p < 0.05$ level of significance). Inter-rater reliability can be defined using the ICC [26,27], with ICCs of 0.70 or higher considered to show excellent test–retest reliability, and ICCs of 0.50–0.70 indicating moderate test–retest reliability [28]. Cronbach’s alpha correlations of between 0.6 and 0.8 represent moderate, but satisfactory, agreement while correlations of above 0.8 correspond to high agreement [26,27].

Concordance with clinical records. Validation of retrospective self-report data is extremely difficult, but was attempted by comparing responses with the best available information, i.e. clinical case notes, particularly the history taken at treatment intake. Where information was available from both, the rate of concordance was assessed. The data from sections 2–9 of the instrument were compared with clinical records to obtain a measure of concurrent validity. Eight variables were included in this analysis: ‘age of first use’ and ‘age of first daily use’ of both drugs: opiates (heroin and other opiates) and cocaine (powder and crack). Differences were calculated for each variable between data obtained from clinical records and during the interview using LDUH. In obtaining data from the clinical records the intake assessment was the primary source; however, if the information was not available from the history, the researcher searched the rest of the case file.

Definitions

- ‘Drug-using career’ (DUC) refers to a longitudinal characterisation of an individual’s use of drugs over a lifetime, defined as the time gap from initiation to most recent episode of use [6].
- ‘Length of career’ is the total number of months of drug use (DUC) or treatment (‘treatment career’) [5]. It is calculated as the time difference between initiation and cessation (or at the last observation point if the individual is still using drugs or is currently in treatment) [5].

- ‘Phase of DUC’: period (of at least a month) defined by consistency in all the parameters of substance use: frequency, amount and/or administration route; it is measured, for each drug, in months. Thus, when any of the above indicators change, a new phase is initiated.
- ‘Phase of treatment’: period of identified treatment, e.g. out-patient treatment, residential rehabilitation treatment, measured in months.
- ‘Phase of abstinence’: period of time in which the subject is not using the substance. Its length is measured in months for each drug.

Results

Sample characteristics

The sample consisted of primarily male (75%) and white (85%) clients. Their average age was 38.3 years [median = 37.0, standard deviation (SD) = 8.7] and mean length of their DUC was 214.6 months (median = 190.0, SD = 101.8) (around 18 years). The majority of participants had used both heroin and cocaine (80%), and most were injectors (62.5%). No significant difference was observed in the pattern of the main drugs used or in the misuse of other substances in relation to interview location or gender. The majority of participants had attended out-patient treatment during their DUC for an average of 48.6 months (median = 29.5, SD = 54.6). Fewer clients reported any period in residential rehabilitation treatment, Narcotics Anonymous or treatment in prison.

The time to first contact with treatment services, defined as the gap between initiation of heroin use and treatment seeking, was 102.6 months, or approximately 9 years (median = 93.0, SD = 72.7). However, for participants with criminal convictions that involved mandated treatment ($n = 14$), the time from initiation to first treatment contact was shorter (mean = 74.1 months, SD = 54.3) than for the 26 clients

(mean = 117.9 months, SD = 77.5) without criminal convictions ($t = 2.081$, $p = 0.045$).

Reliability

Inter rater-reliability. Both Cronbach’s alpha and ICC coefficients were calculated for the selected items. A two-way random ‘absolute agreement’ model was used to test inter-rater reliability. The results are presented in Table 1.

When testing inter-rater reliability, all but two of the items had ‘high agreement’ between raters (above 0.8 in the estimated Cronbach’s alpha). For the ‘number of phases of crack cocaine use’ item ($r = 0.54$) and for ‘number of heroin abstinence periods’ item ($r = 0.60$), agreement was moderate. The same items present low agreement for the calculated ICC (below 0.5): 0.38 and 0.44, respectively [28].

Test–retest reliability. For test–retest reliability, a two-way ‘absolute agreement’ mixed model was used. All but two of the items had a ‘high agreement’, demonstrated by a Cronbach’s alpha higher than 0.8. For ‘number of phases of crack cocaine use’ item (0.69) and ‘number of heroin abstinence periods’ item (0.71), agreement was moderate. These two variables plus ‘number of out-patient treatment periods’ items have an ICC lower than 0.8 (0.52, 0.55 and 0.68, respectively), which represents a ‘moderate’ (ICCs of 0.5–0.7) agreement [28]. These results are presented in Table 2.

Concordance with clinical case notes

Data collected from the LDUH on first use and first daily use of both heroin and cocaine were compared with clinical records to assess consistency of reports. In the client files, the ‘history’ part of the intake interview was examined first and, if the information was not available there, the researcher trawled the file for these items. In 75% ($n = 30$) of clinical records it was possible

Table 1. Inter-rater reliability of the Lifetime Drug Use History Questionnaire

Item	Cronbach’s α	Items mean	Intraclass correlation coefficient single measures (95% CI)
Length of drug-using career	0.997	241.2 months	0.993 CI (0.975–0.998)
No. of phases of heroin use	0.943	13.2	0.885 CI (0.624–0.970)
No. of phases of crack cocaine use	0.536	7.5	0.382 CI (–0.474–0.859)
No. of heroin abstinence periods	0.601	3.5	0.436 CI (–0.258–0.822)
No. of crack cocaine abstinence periods	0.935	2.6	0.893 CI (0.489–0.981)
No. of out-patient treatment periods	0.911	1.3	0.850 CI (0.497–0.961)
Total length of out-patient treatments	0.978	29.0 months	0.960 CI (0.849–0.990)
No. of incarceration periods	0.972	2.9	0.941 CI (0.792–0.985)
Total length of incarceration periods	0.976	44.0 months	0.942 CI (0.766–0.986)

to find all the required information. One of the four target variables was missed in the case notes in six cases (15%) and two were missed in three cases (7.5%). In one case (2.5%), no case file was available. These differences are presented in Table 3, indicating the proportions of precise matches between case notes and LDUH and then discrepancies in the remaining cases are examined.

An exact match with clinical records was obtained for 'age of first use of heroin' for 47.2% ($n=17$) of heroin users. Very good agreement (only 1 or 2 years of difference) was found in 36.1% of cases ($n=5$). For crack cocaine, a complete match was observed for 'age of first daily use of crack cocaine' in 25% ($n=7$); 35.7% ($n=10$) presented very good agreement, as defined previously. As shown in Table 3, greater discrepancies were identified for crack cocaine than heroin, with 17% of cases having discrepancies of 9 years or more in the age of first crack cocaine use.

Discussion

The study was a preliminary test of the LDUH, assessing two aspects of reliability and comparing data gathered from the LDUH with standard history-taking in clinical notes. High levels of inter-rater and test-retest reliability were shown for six of the eight items

assessed, with only number of phases of crack cocaine use and number of periods of heroin abstinence having Cronbach's alpha scores of less than 0.9, indicating 'high agreement', on inter-rater reliability. For test-retest, these two items again were the only two with Cronbach's alpha scores of less than 0.8.

The clinicians collecting data found the method acceptable and the use of key life events in the time-line as anchor points as a helpful tool in collecting histories. The study also provided useful information on DUC, particularly in the context of treatments provided through the criminal justice system, within an acceptable interview time (average 60 minutes) and good levels of acceptance by patients and interviewers. Participants had been in community treatment for an average of 3.7 years of their DUC, but participants did not usually start attending treatment until just under 10 years after the start of the DUC, although less for clients engaged through criminal justice.

Although it was not possible to validate responses, the comparison made between LDUH and clinical notes show significant inconsistencies and reveal some limitations in the recording of information in standard note-taking. In 10 cases there was insufficient information to make an adequate comparison, because of omissions in case notes. While acknowledging the finding of Engles, Knibbe & Drop [29] that age of

Table 2. Test-retest reliability of the Lifetime Drug Use History Questionnaire

Item	Cronbach's α	Items mean	Intraclass correlation coefficient single measures (95% CI)
Length of drug-using career	0.978	220.1 months	0.975 CI (0.938–0.990)
No. of phases of heroin use	0.946	11.4	0.900 CI (0.756–0.961)
No. of phases of crack cocaine use	0.686	5.4	0.516 CI (0.065–0.797)
No. of heroin abstinence periods	0.714	3.0	0.553 CI (0.143–0.804)
No. of crack cocaine abstinence periods	0.907	1.9	0.839 CI (0.596–0.941)
No. of out-patient treatment periods	0.816	1.5	0.677 CI (0.346–0.860)
Total length of out-patient treatments	0.972	43.5 months	0.949 CI (0.875–0.979)
No of incarceration periods	0.973	2.5	0.950 CI (0.878–0.980)
Total length of incarceration periods	0.972	28.5 months	0.944 CI (0.865–0.977)

Table 3. Difference observed between data obtained from interview with the Lifetime Drug Use History Questionnaire and from clinical records

Differences	Age first use heroin	Age first daily use heroin	Age first use crack cocaine	Age first daily use crack cocaine
0 year (complete agreement)	47.2% (17/36)	32.4% (11/34)	20.7% (6/29)	25.0% (7/28)
1–2 years	36.1% (13/36)	41.2% (14/34)	13.8% (4/29)	35.7% (10/28)
3–5 years	13.9% (5/36)	17.6% (6/34)	31.0% (9/29)	25.0% (7/28)
6–8 years	2.8% (1/36)	5.9% (2/34)	17.1% (5/29)	7.1% (2/28)
9–11 years	0	3.0% (1/34)	6.9% (2/29)	0
12–14 years	0	0	10.5% (3/29)	7.1% (2/28)

onset reports increase with advancing age at the time of interview, the inconsistency of any form of recording and disparities in onset ages (particularly for cocaine) between LDUH recording and case notes are a source of concern. If we are to continue to regard history-taking as a core part of the intake process, then we owe it to clients to improve the consistency of data collection and the mechanisms for anchoring data against other key life events.

As with any retrospective study, recall bias is a limitation, particularly when the events described may be 20 years earlier. Even though the literature supports the reliability and validity of self-reported alcohol [11,30] and drug use [13], concerns about memory errors should be considered. There is also the possibility of under-reporting of sensitive issues such as offending [23]. Further validation with collateral informants could address this issue, and criminal records could be accessed [5].

Despite good inter-rater and test-retest reliability, the time between interviews was short compared to other instrument development studies in which intervals of 1 week [30], 15 days [17] and 4 and 6 weeks [10–12] have been described. This may have increased recall of previous report, inflating consistency of reporting. We have no grounds for presuming that the inconsistencies in the case notes are any more problematic than those in the LDUH, and it is particularly interesting to note the huge disparities around cocaine onset ages, with only 20% of clients reporting the same age of onset for crack cocaine use in the history as in the LDUH.

It is hoped that the LDUH will be an advance on standard assessments in consistency of data collecting, but it also has potential clinical utility. The visual presentation of substance use histories for key life events may be an effective tool in helping clients to appreciate how life events influence drug use. Knowledge of the past course of a client's illness can affect current and future treatment strategies [10,31] and mapping effective treatment options, or in educating relatives and friends [32]. By constructing a life chart, a client can create a portable history of their drug and/or alcohol problems in the form of a graph that can be reviewed with treatment providers, changed where necessary and consulted when decisions about treatment are made, enhancing the therapeutic relationship and involving clients as active participants in their treatment process. The tool (available from the authors) is being used both in further research studies and in routine clinical activities.

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